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COUNTY COMPREHENSIVE EARTHQUAKE PREPAREDNESS PLANNING GUIDELINES

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EARTHQUAKE PREPAREDNESS
PROJECT**

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COUNTY

**COMPREHENSIVE EARTHQUAKE PREPAREDNESS
PLANNING GUIDELINES**

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*These Guidelines are based on a document originally developed by the
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BAREPP



**BAY AREA REGIONAL
EARTHQUAKE PREPAREDNESS
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COUNTY

COMPREHENSIVE EARTHQUAKE PREPAREDNESS PLANNING GUIDELINES

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COUNTY

COMPREHENSIVE EARTHQUAKE PREPAREDNESS PLANNING GUIDELINES

INTRODUCTION

The Comprehensive Earthquake Preparedness Planning Guidelines are designed to help county governments develop a comprehensive plan for an effective, coordinated response to a major damaging earthquake. The Guidelines are designed to be used by the County elected officials, the County Administrative Officer, County departments and agencies, and appointed commissions and boards. The success of the planning effort depends heavily on the firm direction and support of the county's executive management.

Knowledge of seismic phenomena and their potential effects on urban centers is constantly growing. A major damaging earthquake occurring in any heavily urbanized area will produce devastating effects. Most counties currently have emergency response and preparedness plans adequate for moderate earthquakes, but local, State and Federal officials agree that these measures will be inadequate to deal with the damage, casualties, and disruption of services following a major damaging earthquake.

Thousands of people could be killed or injured depending on the location and time of day, and billions of dollars in property damage will be sustained. Loss of productivity will be widespread and long lasting. The event will affect millions of people, not only in the immediate area, but throughout the rest of the nation as well. While nothing can be done to prevent earthquakes from occurring, much can be done to prepare for and mitigate the effects of these potentially catastrophic events.

Mitigation and preparedness actions taken through a comprehensive county effort before a major damaging earthquake occurs will result in more efficient, less costly response and recovery efforts.

These Guidelines deal primarily with individual county plans, activities and responsibilities. The use of the Guidelines should result in the formulation of a county multi-year earthquake hazard reduction plan, improved response plans and procedures, and a planning element for short-term recovery.

The Guidelines are designed to provide guidance to county governments in preparing comprehensive plans, but should not be considered as sample or model plans.

In developing and updating its plans the county should recognize its role within the regional context of damage to lifeline networks, displaced daytime populations, etc. Standard mutual aid resources may not be available and a joint approach to solving the problem of limited resources will be necessary.

The Guidelines are compatible with the Federal Emergency Management Agency's (FEMA) Integrated Emergency Management System (IEMS) planning approach and have both FEMA and the California Office of Emergency Services (OES) endorsements. While specific to earthquake disaster planning, the planning process described in Initiating the Process can also be used to examine the adequacy of planning for other hazards.

The Guidelines consist of four parts: Developing Your Plan, the Planning Guide, References, and Glossary.

Part I - Developing Your Plan - outlines steps for setting up a county-wide comprehensive earthquake preparedness planning process, developing comprehensive plans and implementing a multi-phased earthquake preparedness program.

Part II - The Planning Guide - is the heart of the guidelines. Divided into three planning elements corresponding to time phases, the planning guide covers preparedness and mitigation, emergency response, and short-term recovery. For each time phase, it describes principal functions, actions and responsibilities to consider while developing the county's earthquake preparedness plans.

Part III - References - is a bibliography of publications related to specific earthquake preparedness and mitigation topics. These publications can be used as tools to assist in planning and implementation activities.

Part IV - Glossary - defines selected terms used in these Planning Guidelines.

PART I

DEVELOPING YOUR PLAN

COUNTY COMPREHENSIVE EARTHQUAKE PREPAREDNESS PLANNING GUIDELINES

PART I - DEVELOPING YOUR PLAN

This section provides a step-by-step approach for a county to begin a comprehensive earthquake preparedness planning effort, or to augment an existing planning effort. It proposes greater integration and coordination of long term seismic safety preparedness and mitigation programs, emergency response and post-earthquake recovery planning. It is divided into three major sections:

- PHASE I -- Initiating the Planning Process
- PHASE II -- Plan Development
- PHASE III -- Plan Implementation

Before undertaking the process outlined in this section, some thought should be given to the following general considerations.

1. Importance of Intergovernmental Planning

Major damaging earthquakes can cause numerous deaths and injuries and seriously disrupt normal operating conditions over a wide regional area. The impact on a county must be measured not only from problems within the county but also those resulting from damage to the regional lifeline networks serving the county. Disruption of electricity, gas, water, and sewer systems, and transportation and communication networks, can significantly reduce or stop day-to-day operations even in an area not directly damaged.

Mutual aid procedures which work well in smaller emergencies will probably be less effective after a major damaging earthquake because of the wide, geographical impact of the event. Regional, state and federal aid will be required to support the response and recovery activity. Therefore, plans developed by the county must be coordinated for consistency and compatibility with neighboring jurisdictions as well as with other levels of government.

2. Essential Elements to Planning Success

a. Awareness of Need

The potential for loss of life, injury and monetary cost of a major damaging earthquake in or near an urban area is staggering. The cost could be billions for the impacted area alone. The total impact of such

an event on the State and national economy has not been measured, but the physical damage and loss of productivity will have an immediate, costly impact on the tax base, a major source of local and state revenues. No dollar amount can be put on the loss of life.

Preparedness and mitigation measures, coupled with effective response and recovery planning, are essential elements which, if implemented, will significantly reduce the time and cost associated with managing and recovering from the event.

b. Commitment

It is very important that the county executive management fully support the earthquake planning effort, both internally in committing a wide range of county resources and externally. This means actively exploring cooperative arrangements with other counties, school and special districts, and private organizations to develop and implement the plan. It is also necessary to coordinate planning with the State and Federal governments.

c. Education and Training

When the planning effort has been completed and implemented, the county will have the mechanism to successfully carry out earthquake related activities. However, planning is not the same as preparedness. A planning effort is useless without an education and training program to guarantee the plan will work as intended.

3. Earthquake Predictions and Warnings

Earthquakes have been successfully predicted, although no reliable method currently exists for predicting short-term earthquake events.

However, as scientific knowledge increases, local governments may be faced with situations where data indicate a high potential for an earthquake occurring in a matter of days.

Elected officials at all levels of government must be prepared to make difficult and far reaching decisions following any scientifically credible prediction. Decisions may include announcements to the public, protection of critical resources and equipment, the imposition of special procedures and drills at potentially hazardous facilities, the condemnation and evacuation of particularly unsafe buildings, the provision of temporary housing, and the mobilization of state and federal resources before the earthquake.

A comprehensive major earthquake plan should consider actions to deal with predictions and warnings, as eventually they may form a significant part of the planning activity.

PHASE I -- INITIATING THE PROCESS

A recommended ten-step procedure for initiating the comprehensive earthquake preparedness planning process is listed below and discussed in further detail in this section.

The steps are presented in a logical planning sequence. Although it is not necessary to complete the steps in this exact order, omitting any one step could cause costly delays later.

The ten planning process steps are as follows:

- (1) Obtain support from locally elected officials
- (2) Identify political and economic constraints
- (3) Appoint Coordinating Committee
- (4) Inventory existing programs and support activities
- (5) Conduct county-wide earthquake hazard assessment and vulnerability analysis
- (6) Establish key planning assumptions
- (7) Adopt goals and objectives
- (8) Develop overall work program
- (9) Form planning subcommittee structure
- (10) Prepare briefings and make planning subcommittee assignments

1. Obtain Support from Locally Elected Officials

The scope of a comprehensive earthquake planning program makes the support and cooperation of all county departments and agencies essential. This support is best obtained by an enabling resolution or ordinance through the County Board of Supervisors.

To help get this support, a briefing should be arranged for the county's executive management. It should include a general introduction to the threat and potential impact of a major damaging earthquake. Documents and report containing this information exist and can serve as the base for more detailed analysis later in the planning effort.

It is also important to obtain the support of the Chambers of Commerce and other local professional and industrial organizations, so that the private sector is incorporated into the planning process.

2. Identify Political and Economic Constraints

Developing a realistic, acceptable plan depends on knowing existing conditions that may impede or influence the planning effort.

The County Administrative Office should be responsible for examining these issues, and preparing a guidance document to be used in developing the overall work plan.

3. **Appoint Coordinating Committee**

The County Administrative Officer should appoint a Comprehensive Earthquake Preparedness Planning Coordination Committee and, if possible, serve as its chairperson. This committee, made up of key county department managers and agency heads, will be responsible for carrying out Steps 4 through 10 below. It will set the objectives for the various planning subcommittees to be formed; help coordinate planning subcommittee work efforts; review and approve planning subcommittee recommendations; recommend approval of the completed plan to the County Board of Supervisors; participate in exercises; and implement the plan in their own departments. Existing disaster councils could form the nucleus of this group if they have adequate representation. This group must be institutionalized within the county structure for the planning effort to be successful.

Representation from the school district(s), volunteer organizations and the private sector will also be useful.

4. **Inventory Existing Programs and Support Activities**

This step identifies organizations and programs within the county that would support the earthquake preparedness planning effort. For example, an ongoing public safety program through the local fire department could provide support. Coordinating with programs having similar goals will be useful.

5. **Conduct County-Wide Earthquake Hazard Assessment and Vulnerability Analysis**

A realistic earthquake scenario(s), and a damage vulnerability assessment for county-wide resources (structures, equipment and personnel) should be developed for all planning subcommittees to use as a basis for their discussions of the planning functions, and as a test bed for evaluating planning recommendations. The assessment must consider both government and private sector vulnerability, and may require contracting with professional consultants to ensure adequate attention to all concerns.

The vulnerability assessment should be expressed in estimated numbers as much as possible. Percentages and vague terms (such as "many", "a large number" or "most") make planning less effective and can create potential imbalances. All planning subcommittee discussions must be modeled around a realistic scenario and a quantified vulnerability analysis.

6. **Establish Key Planning Assumptions**

Listed below are examples of key planning assumptions that can guide the earthquake preparedness effort. (Note: These assumptions will be further quantified by the hazard vulnerability analyses described in Step 5 above).

- a) A major damaging earthquake is an event or series of events that will result in large numbers of deaths and injuries, destruction of a large

percentage of facilities that serve human needs, an overwhelming demand on State and local response resources and systems, severe long term effects on both general economic activity and on State, local, and private sector efforts to carry out initial recovery activities.

- b) Earthquakes may occur without warning and at a time of day that could produce a maximum number of casualties. Access to and from the damaged areas may be severely restricted for hours and perhaps days. Communications and life support systems will be severely disrupted or destroyed. The maximum possible non-resident work force and tourist population may be present in the affected area. Planners must examine both day and night scenarios.
- c) Earthquakes and resulting aftershocks may trigger secondary events such as fires, tsunamis, liquefaction, landslides, flooding, release of hazardous materials, and dam failures.
- d) Immediately after a catastrophic earthquake, the Governor will declare a state of emergency, followed later by a Presidential disaster declaration. State and Federal life support and emergency response operations can then begin. However, resources may not be available in large quantities for several days, and even then may be insufficient to meet the need.
- e) Although local resources will probably be inadequate to respond to the effects of a major damaging earthquake, local jurisdictions will have to be self sufficient for the first hours and perhaps several days after the earthquake. Local governments must maintain updated resource inventories, and determine priorities and procedures for using available resources.
- f) A major damaging earthquake will cause uneven damage since the intensity of seismic ground motions will vary within a county area. Slightly damaged jurisdictions should be prepared to aid neighboring jurisdictions suffering high concentrations of damage.

7. Adopt Goals and Objectives

The goals and objectives are best put together by the Coordinating Committee. Objectives should provide measurable benchmarks in achieving the overall goals. Listed below are several objectives which the committee may adopt or use as examples.

Goals and Objectives

To Develop a County-Wide Comprehensive Earthquake Preparedness and Response Plan

...that covers all phases of earthquake hazard reduction, preparedness, response and short term recovery.

...that will ensure the ability of county government to function in the immediate post earthquake environment

...that brings together the planning efforts of the various county departments and agencies, non-governmental agencies, and the private sector.

...that is compatible and consistent with planning efforts of adjacent counties, and the State and Federal governments.

...that can be realistically accomplished with the available resources.

...that is user oriented and acceptable.

8. **Develop Overall Work Program**

The Coordinating Committee will develop an overall work program and time schedule for completion. It can be based on the scope of work outlined under each of the three plan guide elements, detailed in Part II of this document, and should take into account ongoing related county activities.

9. **Form Planning Subcommittee Structure**

The Coordinating Committee will determine the best way to accomplish the planning process, using the Planning Guide and considering any known political and economic constraints. Planning subcommittees established by the Coordinating Committee will carry out plan development (Phase II).

The Planning Guide identifies essential functions for each of the three planning elements (which correspond to time periods). Selecting members for each subcommittee depends on the particular element and function since special expertise may sometimes be needed. A number of functions are found in more than one element; in these cases, the same people could continue to work on them.

The County may want to organize its earthquake planning and response organizations into Divisions that would correspond to the various functions. For example, a Hazard Mitigation Division could be established to deal with the functions relating to structural, nonstructural and hazardous materials mitigation.

10. **Prepare Briefings and Make Planning Subcommittee Assignments**

The final step in initiating the planning process is to prepare the necessary materials for planning subcommittee use, make the subcommittee assignments and brief them on their planning responsibilities. If possible, a joint first session of all subcommittees should be held, with a detailed briefing and handout materials regarding:

- a) The scenario
- b) Results of hazard assessment and vulnerability analyses

- c) Role of the Coordinating Committee
- d) Coordinating Committee Overall Work Program
- e) Operating instructions for planning subcommittees sessions
- f) Schedule for completion

PHASE II -- PLAN DEVELOPMENT (Adapting the Planning Guide)

This section outlines the steps for adapting the Planning Guide (Part II of the Comprehensive Earthquake Preparedness Planning Guidelines) to the county's individual needs.

The Coordinating Committee will be responsible for organizing and guiding the overall planning effort. The planning subcommittees will develop the plan, consulting the Coordinating Committee for advice or review of recommendations at critical points.

A recommended approach to accomplishing the plan development phase is listed below and discussed in further detail in this section.

- (1) Organize the planning subcommittees
- (2) Review pertinent materials
- (3) Develop the workplan and timeline
- (4) Establish elements and time frames
- (5) Determine functions to be included in plan
- (6) Review actions and assign responsibility
- (7) Prepare plan content and format recommendations

1. Organize the Planning Subcommittees

Tasks include: appointing a chairperson, determining if membership is adequate to accomplish the activity, designating or requesting additional membership and scheduling meetings. Planning subcommittee membership should be tied to the particular phase and functions being considered. For this reason, it may be necessary and desirable to modify the subcommittee structure from time to time. Subcommittee members should be aware of this.

2. Review Pertinent Materials

Before preparing plans, all subcommittee members must have a common knowledge and understanding of the various briefing materials developed by the Coordinating Committee. The following should be reviewed and discussed by each planning subcommittee.

a) Hazard Vulnerability Analysis

All planning subcommittee members must be briefed on the scenario and resulting vulnerability analyses. Subcommittees cannot work together effectively without a common understanding of the scope and implications of the hazard.

b) The Planning Guide

The Planning Guide (Part II of this document) describes functions applicable to three phases of earthquake planning activity. (It may be helpful at this point to turn to the Planning Guide to review its format and content.) For each function, there are several planning actions noted. These make up a minimum list, and subcommittees should come up with other considerations to include in the county's plan.

c) Existing County Plans and Programs

Step 4 Phase I recommends that the Coordinating Committee compile an inventory of existing county plans and programs related to earthquake preparedness. The list should also include activities of schools, volunteer organizations and the private sector, and programs with similar goals.

The subcommittees should know about existing plans and ongoing efforts, so that new plan developments are compatible with them and duplication is avoided.

The subcommittees should also review existing state and federal earthquake preparedness and response plans for compatibility.

3. Develop the Workplan and Timeline

An Overall Work Program for the comprehensive earthquake planning effort is developed by the Coordinating Committee in Phase I. Each planning subcommittee should develop a workplan based on its assessment of current plans versus the desired level of preparedness planning as outlined in the goals and objectives of the overall planning effort.

Current plans can be rated against Planning Guide actions and should be measured in light of the scenario and hazard vulnerability analysis.

4. Establish Elements and Time Frames

The Planning Guide is organized into 3 elements as follows:

● Preparedness and Mitigation

This element includes actions that can be taken recognizing the potential for a damaging earthquake. The time frame for these activities is from a few years to a few decades before the earthquake occurs.

● Emergency Response

This element includes actions that save lives, minimize injury and protect property during and immediately following the earthquake. The time frame for this element is the first few days to a few weeks after the earthquake occurs.

● Recovery

The recovery element includes actions that return local communities to normal conditions, beginning immediately after the earthquake and continuing from months to years.

5. Determine Functions to be Included in Plan

Each element is divided into functional areas of activity. The functions address the anticipated requirements and efforts posed by a major damaging earthquake. (A chart listing the functions included in each element is shown on page 5 of the Planning Guide.)

Each function should be reviewed for appropriateness to the county's activities or vulnerability and added or deleted as necessary.

Certain functions essential to county operations are often done under contract arrangements with the county. In these cases, the function must be planned for and discussed. Appropriate county and city agency representatives should work together on those functions, with schools and utilities also represented.

6. Review Actions and Assign Responsibility

Under each function associated actions are listed. They should be reviewed and new actions formulated as necessary. The actions listed in the Planning Guide tend to be general to accommodate a wide range of users. These assignments should be reviewed and adapted to reflect the county's organizational structure and areas of responsibility. In adapting the guide to your county be as specific as possible about:

- 1) What is to be done?
- 2) When should the activity be completed?
- 3) What follow up actions are required?
- 4) Who should be responsible for doing it?

Following the list of suggested activities under each function is a section that suggests responsibility to be assigned for activities to specific departments or offices. If possible, lead and support roles should be designated by department for each function.

In addition to the interdepartmental plans recommended in the planning guide, the county will need to develop specific departmental checklists. These

checklists will help department personnel carry out the actions assigned under each function by outlining procedures to be followed.

7. **Prepare Plan Content and Format Recommendations**

The final step in the planning subcommittees' work effort should be to prepare the specific recommendations to submit to the Coordinating Committee.

The output for the Preparedness/Mitigation Element should be a multi-year planning program to serve as the principal long-term guide for all county preparedness, mitigation and response planning activities.

Most counties will already have a Response Plan for Earthquakes. A new plan format may be necessary to incorporate the elements required for catastrophic event planning. The Coordinating Committee should review any recommended changes to the plan format and decide its final form.

The recommended changes to the existing plan, or to be included in the new plan, should be made in the proper format as established by the Coordinating Committee, consistent with State/Federal IEMS and multi-year development planning concepts.

PHASE III -- PLAN IMPLEMENTATION

Phase III concerns plan implementation. County executive management should be responsible for implementing the recommended plans and programs. This should be viewed as a continuing long-term process.

1. Implementation Strategy

Several considerations are essential for implementation.

a. Adoption of a Multi-year Program

A longer range view of plan implementation is particularly important for counties. Certain preparedness and mitigation functions require a sequenced approach which may involve multiple year funding. Many of these measures entail the enforcement of ordinances and regulations which require a continuous program. A number of the steps require extensive interdepartmental implementation planning.

b. Establishment of Implementation Responsibility

Many city and county departments and agencies must share responsibility for implementing the comprehensive earthquake plan. County executive management bears overall responsibility for seeing that the planning is carried out according to schedule.

c. Emphasize Education, Training and Exercising

As pointed out in the introduction to this Guide, the County must include education, training and exercising within the multi-year implementation program. This is particularly applicable to certain of the preparedness functions and to the emergency response functions. These activities are often supported in concept, but overlooked for higher short-term priorities. County emergency management staff and line department exercises in functional area responsibilities are critical to effective performance at the time of the disaster.

d. Adopt a Multi-hazard Implementation Approach

Planning for the major earthquake has resulted in the identification of numerous effects of natural and technological hazards found within larger municipalities. The activities assigned to various departments and agencies for major earthquake response would also be those usually assigned for preparedness/response for other kinds of natural and

technological hazards. The work done in the Planning Process and Plan Development Phases for the major earthquake provides the framework for the development of an all hazards multi-functional plan for the jurisdiction.

e. Establish an Evaluation Component

An evaluation component should be included in the Plan Implementation Process. This component identifies the implementation responsibilities and schedules and provides a monitor for county executive management to gauge the success of the implementation. The evaluation component should be closely tied to the exercises identified in Step 3.

2. Specific Implementation Activities

The implementation activities outlined below relate mostly to the Preparedness and Mitigation Element activities. Emergency Response and Recovery Element activities are more procedural or operational in nature. Implementation of preparedness and mitigation programs will reduce the demands on response and recovery after a major earthquake and will ensure a more effective response.

- a) Enforcing zoning, land use, building code, and hazardous buildings and materials ordinances recommended and enacted under the Plan Development Phase.
- b) Sponsoring, supporting and enacting additional ordinances associated with the above.
- c) Developing and maintaining a database of resources and support services (public and private) which can be used in response and short term recovery.
- d) Establishing an information management system for county emergency management staff and line departments so the database can be used effectively.
- e) Implementing a communications system for the county that allows a full range of interdepartmental communications under emergency conditions. This system must be adequate to meet the operating requirements dictated by the scenario and be able to withstand the disaster so it can be operated in the immediate response phase.
- f) Establishing a bi-level emergency management system within the county. This system should be able to provide simultaneous multiple incident interdepartmental direction and control in the field, as well as county wide (EOC) emergency management of all response activities. This system should include a standard mapping and geo-referencing capability suitable for all county departments.

- g) Implementing county employee education and training programs, and providing related materials to countywide business and industry.
- h) Conducting regularly scheduled exercises to test all elements of the county response plan. Exercises should include a range of workshop problem solving sessions for senior information executives of line departments as well as full operational simulation exercises to test adequacy of facilities, communications and operational procedures and checklists.
- i) Implementing a public information and awareness program applicable to the jurisdiction. This will require cross jurisdictional procedure and content compatibility.
- j) Conducting continued liaison with adjacent counties to ensure intrajurisdictional plan compatibility and procedures development for functional areas involving mass movements and care of the public.
- k) Installing and supporting a comprehensive earthquake education and awareness curriculum within county schools, and encouraging private schools to undertake the same programs.

SUMMARY OF PART I

PHASE I INITIATING THE PLANNING PROCESS

- Obtain Support
- Identify Constraints
- Appoint Coordinating Committee
- Inventory Programs
- Hazard Assessment
- Planning Assumptions
- Goals and Objectives
- Work Program
- Planning Subcommittees
- Briefings and Assignments

PHASE II PLAN DEVELOPMENT

- Organize Subcommittees
- Review Materials
- Develop Workplan
- Establish Elements
- Determine Functions
- Make Assignments
- Prepare Recommendations

PHASE III PLAN IMPLEMENTATION

- Multi-Year Program
- Responsibility
- Education/Training/ Exercises
- Multi-Hazard Approach
- Evaluation
- Specific Activities

FIGURE 1

PART II

PLANNING GUIDE

COUNTY COMPREHENSIVE EARTHQUAKE PREPAREDNESS PLANNING GUIDELINES

PART II - PLANNING GUIDE

PLAN ELEMENTS

The Planning Guide describes functions for preparing for, responding to, and recovering from a damaging earthquake. It specifies actions to be carried out by county agencies and/or non-county government and private entities that have unique and specialized capabilities applicable to earthquake planning and response activities. The functions and corresponding actions are organized into three planning elements, each relating to a specific time period. The three elements are:

- Preparedness and Mitigation

(A few years to a few decades before the earthquake occurs).

The preparedness and mitigation element involves key programs and actions to be developed and implemented on a non-emergency basis within a designated time period.

The county takes these actions recognizing the potential for a damaging earthquake. As the science of earthquake prediction advances, these programs and actions can be easily adapted to serve as the basis for the county's long-term prediction response actions.

- Emergency Response

(The first few days to a few weeks after the earthquake occurs).

This element includes actions that save lives, minimize injury and protect property during and immediately following the earthquake. The actions contained in this element of the guide should supplement any planning a county may have already developed for responding to a major damaging earthquake.

- Recovery

(The first few days to a few years after the earthquake occurs).

The recovery element includes activities that return local communities to normal conditions. These interim actions should be implemented as soon after the earthquake as possible. They will set the framework for the county's longer term (from a few years to possibly a decade) recovery efforts and will have a tremendous impact on long-term recovery options. Since long-term recovery

from a major damaging earthquake will involve numerous jurisdictions and will require a regional approach, it is not addressed in depth in this Planning Guide.

EARTHQUAKE PLAN FUNCTIONS' ACTIONS AND RESPONSIBILITIES

The Planning Guide describes key functional areas for the mitigation/preparedness, emergency response and recovery planning elements. Responsibility for carrying out these functions must be clearly designated.

The earthquake planning and response functions address the anticipated needs posed by a major damaging earthquake. The functions organized under the preparedness and mitigation element require substantial lead-time to carry out. The functions organized under the other two elements are of an emergency nature and are procedure oriented. Within each function, a list of "suggested actions" has been developed for each function.

Responsibility for the earthquake planning and response actions is assigned to various county departments, special districts and non-county organizations. The agencies identified in the Planning Guide are those anticipated to be called upon to perform the various activities in the event of a major damaging earthquake. These organizations are identified by generic agency titles. The names of departments may differ from place to place, but the day-to-day resources and expertise required to carry out these earthquake response functions are present in most counties. The generic titles used in the Guide should help a county assign responsibility for the implementation of earthquake response functions. Adjustments must be made to reflect a county's own organized structure. A county may want to consider organizing its various departments into operating divisions that would correspond to the functional areas outlined in the Guide.

Assignments are made in the form of specific actions to be carried out by designated organizations in support of the overall function. Where a non-county government organization, such as county or federal, special district, school, volunteer, or private sector, is anticipated to play a role in the implementation of a response function, the county should enter into a formal agreement with that organization. The agreement should contain all of the actions assigned to the organization for implementation.

Table 1 on the following page provides a summary of the Planning Guide elements and the functions within each of the three elements. Note that the functions are not static across the elements due to the changing emphasis and activities to be undertaken within each element.

TABLE I: EARTHQUAKE PLAN ELEMENTS AND FUNCTIONS

PREPAREDNESS AND MITIGATION ELEMENT (Actions To Be Taken A Few Years To A Few Decades Before The Earthquake Occurs)	EMERGENCY RESPONSE ELEMENT (Actions To Be Taken During The First Few Days To A Few Weeks After The Earthquake Occurs)	RECOVERY ELEMENT (Actions To Be Taken The First Few Days To A Few Years After The Earthquake Occurs)
<p>FUNCTIONS:</p> <p>Seismic Safety Planning (PMF-1)</p> <p>Mitigation Incentives (PMF-2)</p> <p>Mutual Aid/Joint Powers Agreements (PMF-3)</p> <p>Disaster Assistance (PMF-4)</p> <p>Earthquake Preparedness (PMF-5)</p> <p>Structural Hazard Mitigation (PMF-6)</p> <p>Nonstructural Hazard Mitigation (PMF-7)</p> <p>Hazardous Materials Mitigation (PMF-8)</p> <p>Public Information (PMF-9)</p> <p>Emergency Shelter/Mass Care (PMF-10)</p> <p>Disaster Management (PMF-11)</p>	<p>FUNCTIONS:</p> <p>Disaster Management (ERF-1)</p> <p>Damage Assessment (ERF-2)</p> <p>Communications (ERF-3)</p> <p>Transportation (ERF-4)</p> <p>Debris Clearance (ERF-5)</p> <p>Search and Rescue (ERF-6)</p> <p>Firefighting/Hazardous Materials Management (ERF-7)</p> <p>Emergency Medical Care (ERF-8)</p> <p>Public Information (ERF-9)</p> <p>Emergency Shelter/Mass Care (ERF-10)</p> <p>Resources/Logistical Support (ERF-11)</p> <p>Law Enforcement (ERF-12)</p> <p>Inspection/Condemnation/Demolition (ERF-13)</p> <p>Emergency Road Repair (ERF-14)</p> <p>Utilities/Lifeline Repairs (ERF-15)</p>	<p>FUNCTIONS:</p> <p>Recovery Plan Implementation (RF-1)</p> <p>Recovery Management (RF-2)</p> <p>Recovery Financing (RF-3)</p> <p>Public Information (RF-4)</p> <p>Re-Establishment of Government Services (RF-5)</p> <p>Disaster Assistance (RF-6)</p> <p>Hazard Abatement (RF-7)</p> <p>Transportation Restoration (RF-8)</p> <p>Utilities Restoration (RF-9)</p> <p>Disaster Accounting (RF-10)</p> <p>Long-Term Reconstruction (RF-11)</p>

PREPAREDNESS AND MITIGATION

PREPAREDNESS AND MITIGATION FUNCTIONS

(ACTIONS TAKEN A FEW YEARS TO A FEW DECADES BEFORE THE EARTHQUAKE OCCURS)

Earthquake preparedness and mitigation functions include actions taken over a period of time to reduce loss of life, injury and property loss due to a damaging earthquake. These actions, including hazard mitigation, education and training, and long term planning programs require time to be carried out under the normal living and working conditions of the participants. Some actions, such as the strengthening of a hazardous building, can achieve permanent improvements; others, such as training, may need periodic renewal. If implemented, these programs can reduce the costs of response planning and the demand for resources when the earthquake occurs.

SEISMIC SAFETY PLANNING (PMF-1)

This function encompasses the goals and objectives stated in the jurisdiction's Seismic Safety Plan. It includes policy recommendations and program development to reduce or prevent the threat to life and property from earthquakes and their secondary effects. These programs, based on risk and vulnerability analyses for areas potentially affected by a damaging earthquake, include land use controls to keep human occupation from dangerous locations, and programs incorporating hazard mitigation for seismic safety in the building and upgrading of structures. This function also includes pre-earthquake planning to guide the redevelopment and reconstruction following an earthquake, and the establishment of a Recovery and Reconstruction Authority to manage the recovery process. Specific ways to implement these policies and programs are included in other functions such as Earthquake Preparedness, Structural and Non Structural Hazard Mitigation.

Suggested Actions

- (1) Conducting risk assessment and hazard vulnerability analyses (this could be part of the county's multi-hazard vulnerability study);
- (2) planning for future development and redevelopment that will consider the potential threat of earthquakes and the secondary effects of landslides, liquefaction, ground rupture, tsunami and seiche;
- (3) enacting and enforcing zoning ordinances and other appropriate land use controls;
- (4) formulating, enacting and promoting building codes and performance standards for new building construction or reconstruction;
- (5) formulating a post-earthquake plan for recovery and redevelopment;

- (6) establishing a Redevelopment and Reconstruction Authority for activation in the emergency response and recovery phases. The Redevelopment and Reconstruction Authority will have responsibility for setting standards and policy, reviewing plans, and guiding the recovery process; and
- (7) becoming familiar with federal processes for structural post-hazard mitigation team; identifying those who should be involved and establish dialogue.

Suggested Assignments

Planning Department: overall seismic safety planning and hazard vulnerability analyses.

Building and Safety Department, Transportation Department and Flood Control District: locate and classify all potentially hazardous structures and facilities to facilitate mitigation programs, and post-earthquake selective evacuation and damage assessment.

Fire Services Department: locate hazards, including hazardous materials.

Economic Development Department: mitigation and redevelopment planning.

County Counsel: develop appropriate ordinances.

County Assessor's Office: provide data files and building inventories.

Board of Supervisors: provide policy support and required legislation.

Support could come from the International Conference of Building Officials, the Structural Engineer's Association and local chapters of the American Society of Civil Engineers, for inspection of hazardous structures.

MITIGATION INCENTIVES (PMF-2)

Incentives are immediate or short-term rewards for taking long-range mitigation and preparedness actions. Rewards may be tax incentives, protection against legal liability, public recognition or other similar benefits. This also includes limiting or eliminating disincentives to taking appropriate mitigation and preparedness actions.

Suggested Actions

- (1) Providing immediate rewards for taking mitigation and preparedness actions;
- (2) encouraging individuals and organizations to understand the need for long-term strategies;

- (3) formulating and enacting ordinances and statutes which provide tax incentives for taking specific, permanent mitigation actions; and
- (4) taking steps to lessen potential legal liability and other disincentives to mitigation or preparedness actions.

Suggested Assignments

Chief Administrative Office: implement mitigation incentive programs (including seeking financial assistance).

County Counsel: research legal disincentives/incentives.

Economic Development Department: identify existing programs within the county that are compatible with earthquake mitigation objectives.

Public Information Office: promote preparedness activities and publicizing incentive programs.

Board of Supervisors: support preparedness and mitigation programs, including proposing and adopting ordinances.

Support could come from public service organizations and public utilities.

MUTUAL AID AND JOINT POWERS AGREEMENTS (PMF-3)

This function establishes agreements with government entities to provide resources and logistical support for earthquake response.

Suggested Actions

- (1) Subscribing to the State's Master Mutual Aid Agreement;
- (2) adopting specific mutual aid agreements between local and/or special purpose governments;
- (3) maintaining, regularly updating and sharing resource inventories specific to agreements;
- (4) negotiating contingent acquisition agreements between emergency service providers, vendors and contractors;

- (5) selecting and empowering an existing joint powers agency (or creating such a function within an existing agency) to plan and recommend earthquake preparedness activities to the JPA's signatories; and
- (6) recommending legislation to encourage special-purpose governments, public utilities and other institutions to participate in mutual aid or joint powers agreements.

Suggested Assignments

Chief Administrative Office: overall coordination of Mutual Aid and Joint Powers Agreements.

County Counsel: formulate and review all agreements.

Emergency Services Office: manage agreements and inventories covered by the Master Mutual Aid Agreement.

General Services Department: negotiate contingent purchase agreements with vendors and contractors.

Special Purpose Governments and Service Districts: supplement conventional mutual aid.

Support could come from various private sector agreements and contracts.

DISASTER ASSISTANCE (PMF-4)

Disaster assistance actions will lessen the financial impact of the event on the public and private sectors. The function develops guidelines for eligibility and establishes procedures for the effective delivery of disaster assistance after a damaging earthquake, and establishes procedures within the County for reimbursement of disaster assistance expenditures.

Suggested Actions

- (1) Listing and analyzing sources of financial or in-kind grant assistance to earthquake victims;
- (2) enacting legislation to provide higher funding for disaster assistance;
- (3) determining recoverable costs in response to a damaging earthquake and establishing accounting procedures for billing those recoverable costs;

- (4) reviewing the current status of insurance coverage for earthquake victims and informing the public of the financial losses it may face after insurance and other assistance are exhausted;
- (5) providing tax authorities with an estimate of lost tax revenues after the earthquake;
- (6) providing emergency family assistance training to individuals and emergency service personnel;
- (7) training individuals to basic damage, the number of people affected, and need for additional assistance; and
- (8) identifying potential sites meeting state criteria to be used as Disaster Assistance Center (DAC).

Suggested Assignments

Board of Supervisor's County Administrative Office, County Counsel: determine and resolve policy and liability problems.

Risk Management Department: identify insurance needs and establish procedures for processing claims.

Assessor and Tax Collector: analyze potential public revenue losses and policy options for meeting the County's fiscal needs.

Office of Emergency Services: ensure the appropriate forms and procedures are in place to make it easier to request at the time of the earthquake.

Public Information Office: familiarize the public with the types of assistance available after a disaster, including eligibility requirements.

Support could come from the **American Red Cross** and other **volunteer organizations** that organize private relief activities, and private businesses.

EARTHQUAKE PREPAREDNESS (PMF-5)

Preparedness improves the effectiveness of individuals and organizations in responding to earthquakes. These actions develop information and train individuals, households, neighborhoods, community groups, schools and businesses to be self-sufficient for the first 72 hours after the earthquake. At the local government level, the actions improve the effectiveness of emergency response through the development and implementation of training programs. Inventories other than those carried out for the Emergency Operations Center are included under Disaster Management, PMF-11.

Suggested Actions

- (1) Establishing and maintaining liaisons with outside agencies and other county departments;
- (2) providing training for personnel safety on the job and at home;
- (3) developing departmental programs to train employees in post-earthquake operating procedures;
- (4) establishing and maintaining procedures to safeguard important papers, documents, and financial data;
- (5) developing and conducting training programs for individuals, businesses, community leaders, and school personnel on earthquakes, self-help, search and rescue, first aid, firefighting, shelter management, and other emergency response activities; and
- (6) initiating household, neighborhood, school and private business preparedness activities.

Earthquake Education/Awareness

- (1) Developing plans to make all county employees conscious of office and home earthquake preparedness
- (2) distributing earthquake preparedness information to all county employees;
- (3) developing and distributing information to inform the public of the extent and seriousness of the long-term earthquake threat;
- (4) directing the public to sources of detailed mitigation and preparedness information;
- (5) translating information for non-English speaking residents and people with hearing and sight disabilities; and
- (6) collecting and preparing reference lists of vital information.

Neighborhood Self-help

- (1) Providing in-service training workshops for county employees in neighborhood organizing;
- (2) identifying existing departments or organizations which provide service to and have day-to-day contact with the public;

- (3) identifying existing neighborhood networks and resources;
- (4) compiling a demographic profile of area useful to program development;
- (5) identifying target neighborhoods for initial self-help efforts;
- (6) developing a master schedule for the county's program implementators;
- (7) conducting neighborhood orientation meetings to provide information on earthquake threat and potential effects;
- (8) providing information to neighborhood groups on what to do before, during and after an earthquake;
- (9) familiarizing neighborhood groups with information on government preparedness and response plans and types of government disaster assistance;
- (10) providing neighborhood leaders/organizations with sample plans and programs for use in their neighborhoods; and
- (11) developing mechanisms to test and evaluate neighborhood plans.

Business and Industry

- (1) Encouraging local business and industry to plan for the welfare of their employees to promote self-sufficiency for the first few days after the earthquake;
- (2) providing training in identification and mitigation of structural and non-structural hazards, including hazardous materials;
- (3) providing information/education on potential effects of a damaging earthquake;
- (4) helping develop evacuation plans;
- (5) providing information on potential for post-event disaster assistance;
- (6) arranging agreements for the provision of critical equipment, resources and manpower;
- (7) promoting coordination within the private sector through joint private/public sector workshops; and
- (8) initiating a dialogue/coordination with the Chamber of Commerce.

School Safety

- (1) Providing information on identification and mitigation of structural and non-structural hazards;
- (2) developing and adopting an earthquake curriculum for use in the county's public schools;
- (3) instructing, rehearsing and drilling students and employees in correct methods of protecting themselves in an earthquake;
- (4) helping elementary and secondary school students to understand the nature and effects of earthquakes and their related effects;
- (5) developing and publicizing standard operating procedures, especially governing the release of students and teachers in emergencies;
- (6) helping local authorities provide emergency shelter and mass care; and
- (7) encouraging private school administrators to develop preparedness and mitigation programs, and to disseminate available preparedness information.

Volunteers

- (1) Establishing policies and procedures for using volunteers before, during and after the earthquake emergency;
- (2) listing existing volunteer groups, specifying their expertise and resources;
- (3) establishing a contact person in each group to coordinate that group's earthquake preparedness and response activities;
- (4) encouraging individuals to join existing volunteer organizations;
- (5) encouraging coordination between various volunteer groups;
- (6) providing information to volunteer organizations on earthquake threat, self-sufficiency, and how they can assist the county in an earthquake; and
- (7) training volunteers in search and rescue, first aid, firefighting, and other emergency response activities.

Suggested Assignments

Emergency Services Office: coordinate earthquake preparedness programs.

County Administrative Office: delegate program development and administration to those departments able to carry out the required program.

Personnel Department: manage the development of survival and response training for county employees and their families.

Planning Department: develop threat scenario information.

Data Management Services: safeguard county records.

Economic Development Department: conduct inventories and act as liaison to various neighborhood, volunteer and business groups.

Sheriff's Department, Fire Services Department and Emergency Services Office: develop information and training programs dealing with hazard mitigation and self-sufficiency.

School Districts: develop and maintain seismic safety and preparedness in schools.

County Superintendent of Schools: coordinate and advise on school programs.

Support could come from the American Red Cross, Chamber of Commerce, volunteer organizations, private schools, community groups and private businesses.

STRUCTURAL HAZARD MITIGATION (PMF-6)

These actions reduce the risks to human safety caused by the effects of earthquakes on man-made structures. Earthquake shaking and surface faulting and the secondary effects of landslides, liquefaction, tsunamis and seiches damage structures. The structures are typically divided into three categories: buildings, public works facilities, and lifeline networks.

Suggested Actions

- (1) Inventorying and classifying all buildings and other structures vulnerable to earthquake damage;
- (2) assessing relative risk to public safety for each class of structure;
- (3) enacting and enforcing necessary ordinances and statutes to mitigate the threats;
- (4) preparing lists of vulnerable structures for use in evacuation and damage assessment; and
- (5) reviewing alternatives to reducing or eliminating structural hazards and proposing appropriate policy/legislation/program remedies.

Suggested Assignments

Board of Supervisors: introduce and support appropriate legislations.

Building and Safety Department: overall planning, and identify and manage hazardous buildings within the jurisdiction.

Transportation Department, Municipal Utilities, Airports and Harbors Departments: assess hazards to those facilities under their management.

Real Property and Parks and Recreation Departments: assess and manage threats posed by county structures.

Flood Control District: manage threats posed by water tanks and dams.

Risk Management Department: assist with hazard assessment and policy issues.

Planning Department: map and assess hazardous areas (in conjunction with hazard vulnerability analyses conducted under Seismic Safety Planning, PMF-1).

Support may be provided by the Structural Engineers' Association (through the coordination of the Office of Emergency Services, OES) help identify unsafe buildings, the American Society of Civil Engineers to help identify unsafe structures, public utilities, and the International Conference of Building Officials.

NONSTRUCTURAL HAZARD MITIGATION (PMF-7)

These actions reduce or eliminate threats to human safety posed by the effects of earthquakes on building contents, mechanical components, furnishings, and other non-structural items within buildings.

Suggested Actions

- (1) Identifying all non-structural hazards and earthquake damage-prone assets within county-owned property which pose a threat to public safety or health;
- (2) proposing strategies for reducing or eliminating these current threats;
- (3) identifying cost-effective alternatives to eliminate these threats in the future; and
- (4) providing guidance to the private sector in identifying and mitigating non-structural hazards.

Suggested Assignments

Building and Safety Department: develop non-structural hazard mitigation programs, and provide training to other County Departments in the identification and mitigation of hazards in the home and workplace.

Transportation Department, Municipal Utilities, Airports and Harbor Departments: assess and mitigate the threat on county-owned property.

Risk Management Department: assist in determining priorities for the development of a long-term program.

Real Property Division and Parks and Recreation Department: manage the threat on the county's property.

Other departments as necessary to carry out actions in their own offices for their equipment and operations.

HAZARDOUS MATERIALS MITIGATION (PMF- 8)

These actions by public agencies and private organizations reduce the threat to life and property caused by hazardous and toxic materials.

Suggested Actions

- (1) Listing, mapping and storing the location of facilities which process, store and use hazardous, toxic or unstable materials;
- (2) conducting a hazard vulnerability analysis of high risk facilities, including but not limited to:
 - a) petroleum product processing areas
 - b) research institutes (eg. chemical, biological, radioactive)
 - c) waste and water treatment plants
 - d) major chemical industry installations
- (3) developing a system to visually identify facilities which process, store and use hazardous materials;
- (4) training employees in hazardous materials mitigation and spill clean-up;
- (5) listing location of equipment and supplies necessary for containment of hazardous spills; and
- (6) developing evacuation plans for areas threatened by the potential release of hazardous materials.

Suggested Assignments

Fire Services Department: inspect hazardous material facilities, and develop mitigation and training programs.

Emergency Services Office and Transportation Department: coordinate resources and equipment necessary for containment of hazardous spills.

Sheriff's Department and Transportation Department: evacuation and alternative route planning.

Planning Department: mapping and hazard vulnerability analyses.

Support could come from private toxic materials management companies to assist the fire department, the gas company and petroleum products pipeline companies and other private companies to manage hazardous materials under their control.

PUBLIC INFORMATION (PMF-9)

The public information function is to conduct an intensive public awareness and information campaign through the press and other communications services. The campaign educates the public on the earthquake threat and potential hazards, government preparations, and long and short-term hazard mitigation and preparedness actions.

Suggested Actions

- (1) Designating an earthquake public information officer;
- (2) developing a county-wide public information campaign;
- (3) making use of all available media outlets to maintain public awareness of the threat;
- (4) establishing a county public information policy for earthquake preparedness and response;
- (5) advising and assisting public officials with media relations;
- (6) coordinating information efforts with other county departments, cities within the county, state and federal governments; and
- (7) establishing an earthquake public information office and rumor control center.

Suggested Assignments

Public Information Office: develop and maintain and coordinate an earthquake awareness program in conjunction with other county departments and agencies;

Personnel Department: maintain awareness among county employees;

Sheriff's Department and Fire Services Department: disseminate information through community outreach programs.

Emergency Services Office: inform the public of the county's responsibilities and intentions in responding to an earthquake.

Support could come from the **American Red Cross, volunteer organizations, schools, religious organizations, community groups, and private businesses.**

EMERGENCY SHELTER AND MASS CARE (PMF-10)

This function includes actions related to emergency housing, feeding, and non-medical care of earthquake victims and emergency service personnel. Examples are designating shelter sites, identifying shelter support requirements (food, water, sanitation, etc.), and training personnel.

Suggested Actions

- (1) Investigating possible shelter facilities in areas of low seismic risk;
- (2) negotiating agreements with local school districts and others to designate emergency shelter and mass care facilities;
- (3) training professionals and volunteers to manage emergency shelters;
- (4) ensuring access to necessary equipment or supplies, or stockpiling what is reasonable;
- (5) developing a plan to register and answer inquiries about missing persons;
- (6) identifying food, communication, and other support needs in carrying out emergency shelter and mass care; and
- (7) designating relief sites and ensuring availability of supplies and equipment for care of emergency personnel

Suggested Assignments

Social Services Department in conjunction with the **American Red Cross**: coordinate the emergency shelter and mass care function.

Planning Department: locate alternative sites.

Personnel Department: recruit and register volunteers for assistance.

Support for this function could come from the **American Red Cross**, religious organizations and **volunteer organizations** that can staff and manage these facilities, and private businesses.

DISASTER MANAGEMENT (PMF-11)

These actions maintain an organization, equipment and facilities dedicated to timely and comprehensive earthquake response. Actions focus on the development and testing of operational plans and on the maintenance and equipping of an Emergency Operations Center (EOC).

Suggested Actions

- (1) Informing, training and managing the county's emergency services organization and coordinating preparedness activities;
- (2) formulating and maintaining a concept of operations which will address the need for multi-jurisdictional coordination and interaction with the county's EOC, county departmental field activities and state and federal governments;
- (3) proposing or supporting legislation which would permit and protect certain necessary emergency activities;
- (4) preparing, adopting, maintaining and coordinating emergency plans to effectively respond to all potential earthquake events, including their secondary effects;
- (5) maintaining and equipping special purpose and mobile command posts from which to direct and coordinate emergency operations;
- (6) establishing a damage assessment program to generate rapid, accurate intelligence on all critical facilities and functions; and
- (7) developing an information management system.

Response Readiness

- (1) Equipping and maintaining an EOC from which to direct emergency services;
- (2) developing and maintaining a regularly scheduled program of training, tests and exercises (to include critique and evaluation) for all departments and personnel having responsibility for responding to an earthquake.
- (3) maintaining emergency equipment in a state of emergency;
- (4) reviewing emergency plans, procedures and priorities;
- (5) developing and maintaining emergency personnel callback procedures and lists; and
- (6) establishing locations for necessary staging areas (i.e., personnel, casualty collection, etc.).

Communications

- (1) Developing emergency communications plans and procedures;
- (2) conducting vulnerability analyses of communications sites and equipment;
- (3) testing, maintaining and safeguarding all emergency communications systems, including back-up power supplies;
- (4) identifying critical spare parts requirements;
- (5) establishing communication capabilities with other county agencies needing services during the emergency;
- (6) organizing and training professional and volunteer communicators to assist the county in an emergency; and
- (7) developing and maintaining a local Emergency Broadcast System with protected communication links to the EOC.

Transportation

- (1) Developing emergency transportation plans and procedures;
- (2) developing plans to utilize equipment and personnel of other agencies supplying common carrier services;
- (3) conducting a vulnerability analysis of transportation systems and facilities to include roadway, railway, air and harbor;

- (4) maintaining emergency vehicles and road repair equipment in a state of readiness;
- (5) developing and maintaining emergency power supplies for DOT yards; and
- (6) assisting in evacuation planning.

Resource Management

- (1) Developing and maintaining up-to-date inventories of vital equipment and resources, noting availability;
- (2) stockpiling and maintaining critically needed supplies and equipment;
- (3) negotiating open purchase order systems for emergency response agencies;
- (4) determining resource shortfalls; and
- (5) identifying resource staging areas.

Suggested Assignment

Board of Supervisors: provide policy support, adopt ordinances and plans, and appropriate required funding.

County Administrative Office, Emergency Services Office: coordinate EOC operations and assign specific responsibilities and actions to appropriate county departments and agencies.

County Emergency Response Departments: develop plans, and annexes, formulate standard operating procedures, conduct drills, and create fixed and mobile command posts.

Communications Department: equip the EOC and other emergency operations activities with appropriate communications.

Support could come from **Public Utilities**, the broadcast media, and volunteer networks.

**PREPAREDNESS AND
MITIGATION ELEMENT**

FUNCTION MATRIX

	SEISMIC SAFETY PLANNING	MITIGATION INCENTIVES	MUTUAL AID/JOINT POWERS	DISASTER ASSISTANCE	EARTHQUAKE PREPAREDNESS	STRUCTURAL HAZARD MITIGATION	NONSTRUCTURAL HAZARD MITIGATION	HAZARDOUS MATERIALS MITIGATION	PUBLIC INFORMATION	EMERGENCY SHELTER/MASS CARE	DISASTER MANAGEMENT		
BOARD OF SUPERVISORS	●	●		●		●					●		
COUNTY ADMINISTRATION		●	●	●	●						●		
COUNTY COUNSEL	●	●	●	●									
BUILDING & SAFETY	●					●	●						
COMMUNICATIONS											●		
COMMUNITY DEVELOPMENT	●	●			●								
COUNTY ASSESSOR													
DATA PROCESSING					●								
EMERGENCY SERVICES			●	●	●			●	●		●		
FINANCE					●								
FIRE	●				●			●	●		●		
GENERAL SERVICES			●										
PARKS & RECREATION						●	●						
PERSONNEL					●				●	●			
PLANNING	●				●	●		●		●			
PUBLIC INFORMATION		●		●					●				
PUBLIC WORKS	●					●	●	●					
RISK MANAGEMENT				●		●	●				●		
SHERIFF					●			●	●		●		
SOCIAL SERVICES										●			
TRANSPORTATION	●							●					
AIRPORT/HARBOR						●		●					
AMERICAN RED CROSS				●	●				●	●			
PRIVATE SECTOR	●		●	●	●	●		●	●	●	●	●	
SCHOOLS					●				●				
SPECIAL DISTRICTS	●		●			●							
VOLUNTEER ORGANIZATIONS			●	●	●				●	●			
UTILITIES		●				●		●					

EMERGENCY RESPONSE

EMERGENCY RESPONSE FUNCTIONS

(ACTIONS TAKEN DURING THE FIRST FEW DAYS TO A FEW WEEKS AFTER THE EARTHQUAKE OCCURS)

Emergency response functions are actions taken immediately after an earthquake to save lives, alleviate suffering and prevent further disaster. The emergency response phase is expected to last at least 72 hours during which local emergency services will be overwhelmed by demand. The declaration of an emergency may continue in effect well into the recovery phase.

DISASTER MANAGEMENT (ERF-1)

These actions involve the overall coordination and management of the County's emergency response. They include mobilizing personnel and equipment, conducting damage assessment, developing priorities for resource allocations, ensuring that adequate public information is being delivered, and that the County's response is being made in the most effective manner possible. Also included in this function is coordination with State and Federal support activities.

Suggested Actions

- (1) Mobilizing emergency response agencies and activating the EOC and other command centers and posts;
- (2) re-establishing secure communications links to all emergency response organizations and checking back-up units;
- (3) declaring a local emergency;
- (4) activating the Emergency Broadcast System;
- (5) formulating a comprehensive picture of the damage, needs and local resource shortages;
- (6) coordinating the efforts of volunteer and private groups;
- (7) activating mutual aid agreements and determining support requirements;
- (8) deploying resources to maximize the number of lives saved;
- (9) managing the information and reporting system;
- (10) establishing response priorities;
- (11) recalling county employees as necessary;

- (12) documenting all expenditures or commitment of resources, equipment or personnel to the earthquake response; and
- (13) coordinating with appropriate State and Federal support activities.

Suggested Assignment

County Board of Supervisors acting through the Chairman of the Board: has overall responsibility for this function.

Emergency Services Office: coordinate the EOC and field response organizations.

Personnel Department: help with administrative and clerical support.

Sheriff's Department, Fire Services Department and primary emergency action departments: report response status and reserve strength.

Other departments with emergency responsibilities: report response status.

Support could come from utility companies, in reporting response and damage control status, and the American Red Cross in reporting the location and readiness of emergency shelters and volunteer service.

DAMAGE ASSESSMENT (ERF-2)

These actions are taken to ascertain the severity and extent of the initial damage and injury information. Assessments will provide the specific information needed to apply priorities to resource deployment.

Suggested Actions

- (1) Conducting ground and aerial surveys of damage, casualties and the status of facilities (dams, utilities substations, hospitals, etc.) essential to public welfare and safety. This initial information is essential in setting priorities for the deployment of resources and directing/coordinating emergency response operations;
- (2) alerting and dispatching damage assessment teams for inspection of buildings and structures;
- (3) collecting, recording and totaling the type and estimated value of damage to structures, facilities and systems, and building contents;
- (4) conducting a field survey of damage to water and sewage and lifelines;

- (5) sharing through the EOC all damage observed from aerial reconnaissance or ground survey;
- (6) refining the estimates of damage, assisted by the inspection and demolition activities; and
- (7) using damage assessment to identify areas for search and rescue and to establish priority of resource allocation and management.

Suggested Assignment

Emergency Services Office: coordinate damage assessment.

Building and Safety, Transportation and Real Property Departments: inspect structures.

Sheriff's Department and Fire Services Department and all departments with emergency responsibilities and communication links to the Emergency Operations Center: relay damage information.

Planning Department: provide mapped information of damage and facilities.

Structural Engineers Association of California: supplement county personnel in conducting required inspections (per agreement with State OES).

Support could come from **Radio Amateur Civil Emergency Service (RACES)** and **Radio Emergency Action Community Team (REACT)** volunteer communicators to supplement damage reporting capability, private citizens to report hazards and incidents to primary response agencies, and the **American Red Cross** to report residential damage assessment.

COMMUNICATIONS (ERF-3)

These actions establish communications links throughout the disaster area to support emergency functions. The emergency communications links include those channels used in disaster management activities and public warning (emergency broadcast system). Public information is not included under this function.

Suggested Actions

- (1) Activating the emergency communication system*;
- (2) routing all damage assessment information through the EOC;
- (3) assessing power availability and activating volunteer radio groups;

- (4) deploying communication equipment to designated field sites and emergency shelter in or at adjacent to heavily damaged areas; and
- (5) checking for activation of telephone line load control.

*This will include those systems which are integral parts of emergency services, health public transit, police, fire, utilities, transportation and public works, as well as citizens band (CB) and HAM (RACES) networks. It does not include commercial radio and television systems (see ERF-9).

Suggested Assignments

Emergency Services Offices: coordinate overall communications.

Communications Department: maintain communications networks.

Sheriff, Fire Services, and Transportation Departments: support through their respective radio networks.

Support for communications could come from volunteer communicators known as REACT (Citizens Band) and RACES (ham radio).

TRANSPORTATION (ERF-4)

These actions include the mobilization and commitment of transportation systems to move critical personnel and materials.

Suggested Actions

- (1) Mobilizing all transportation emergency personnel and available equipment;
- (2) collecting and assessing all earthquake-related information on damage to the transportation systems and advising all emergency response organizations of breaks in the transportation system and alternative routes;
- (3) committing all necessary and available resources according to established priorities;
- (4) alerting mutual aid partners to impending or actual resource requests;
- (5) maintaining complete records of all communications, assignments, reassignments and status reports on air, rail, port, road, highway and public transit systems and facilities; and
- (6) advising emergency response organizations on traffic routing options and priorities.

Suggested Assignments

Transportation Department: coordinate transportation resources.

Sheriff's Department: control traffic conditions and place barricades.

Local public and private transportation agencies: help move emergency personnel or evacuees.

County Transit District: provide emergency assistance.

Support could come from local construction contractors who will supplement County equipment and personnel. Contractors enrolled in "Operation Bulldozer" may only be called up through mutual aid. Private vehicle towing companies will also be needed to clear streets and roads.

DEBRIS CLEARANCE (ERF-5)

These actions are taken to identify, remove and dispose of rubble, landslides, wreckage and other material which block other emergency response functions.

Suggested Actions:

- (1) Removing, hauling and disposing of debris which hampers emergency response activities;
- (2) cooperating with demolition, road and bridge repair, search and rescue, and firefighting efforts;
- (3) contacting and assigning volunteer organizations, private businesses, and community groups having tools and skills for debris clearance to heavily damaged areas; and
- (4) constructing emergency detours and access roads.

Suggested Assignments

Transportation Department: coordinate debris clearance.

Flood Control District: clear systems.

Planning Department: identify debris disposal sites.

Support could be expected from heavy equipment and construction contractors to move debris, and private citizens to remove smaller obstructions not requiring heavy equipment.

SEARCH AND RESCUE (ERF-6)

These actions include removing trapped and injured persons from landslides, building failures and structural collapses, administering emergency first aid, and helping transport the seriously injured to casualty collection points.

Suggested Actions:

- (1) Mobilizing and dispatching professional and volunteer teams to sites of landslides and building collapse sites, using search and rescue dog teams such as CARDA (California Rescue Dog Association);
- (2) removing trapped and injured persons from damaged or collapsed structures or other imminent danger;
- (3) giving first aid and stabilizing the medical condition of the injured;
- (4) advising the general public through the emergency information center/EBS on precautions when doing light rescue; and
- (5) assisting the damage assessment and emergency medical functions.

Suggested Assignments

Sheriff's Department: coordinate the search and rescue effort, including organizing volunteer teams and expert assistance from outside the County.

Building and Safety Departments: provide technical advice on structural safety in removing trapped victims. The Structural Engineers Association of California can provide volunteer assistance.

Fire Services Department and Private Ambulance Services: to provide transportation of rescued victims.

Support could come from the Explorer Scouts, RACES, and other trained private citizens, including search and rescue dog teams, to assist in seeking out, removing or summoning help to remove people trapped in buildings, vehicles or under debris, and volunteers to help family, neighbors and co-workers escape.

FIREFIGHTING AND HAZARDOUS MATERIALS MANAGEMENT (ERF-7)

These actions respond to fire and hazardous release incidents.

Suggested Actions

- (1) Mobilizing all professional and reserve firefighters and all available equipment;
- (2) dispatching crews (and reassigning, if necessary) to suppress fires according to predetermined priorities;
- (3) relaying all confirmed reports of fires to the EOC's;
- (4) responding to, and containing or neutralizing hazardous material releases according to priorities;
- (5) requesting help from mutual aid partners for assistance following established procedures; and
- (6) providing information to the emergency information center/EBS on the need to suppress and prevent fires.

Suggested Assignments

Fire Services Department: firefighting and hazardous materials management.

Public Health Department: provide information on toxic and non-flammable hazards.

Support could come from hazardous materials management companies to help control and remove dangerous materials, private citizens to help protect their homes and work places, and fire department reserves and volunteers to operate reserve equipment and supplement County staffing.

EMERGENCY MEDICAL CARE AND PUBLIC HEALTH (ERF-8)

These actions provide medical treatment to injured people, stabilize the seriously injured, sort and transport people to hospitals on a priority basis, and protect the public's general health.

Suggested Actions

- (1) Mobilizing and coordinating emergency medical personnel, reserves and volunteers and dispatching them to designated emergency centers;
- (2) mobilizing emergency medical vehicles, equipment and facilities;

- (3) giving first aid to injured persons and transporting them to casualty collection points and/or other appropriate sites as these are designated;
- (4) sorting of injured persons by type and seriousness of injury (triage) and transporting them from casualty collection points to local or outside hospitals;
- (5) evacuating non-critical patients from hospitals;
- (6) monitoring the use of and supplementing medical supplies and other material;
- (7) providing preventive medical services, including, but not limited to, the control of communicable diseases;
- (8) inspecting health hazards in damaged buildings;
- (9) identifying possible sources of contamination;
- (10) inspecting and advising the purity and usability of foodstuffs, water, medical supplies and drugs and other consumable goods;
- (11) advising on general sanitation matters;
- (12) coordinating health related activities among local and private response agencies or groups within the county area.

Suggested Assignments

Public Health Department: coordinate emergency medical care.

Fire Services Department and Paramedic Units: assist in triage, first aid and transport.

General Services Department: procure medical supplies and equipment

Multi-County EMS Agency: coordinate mutual aid requests and assistance

Support could come from private hospitals and clinics for direct medical care, private ambulance companies for medical transport, **American Red Cross** to staff and manage first aid stations, and other trained first aid people such as private citizens with current American Red Cross cards.

CORONER SERVICES (ERF 9)

These actions identify, certify the cause of death and manage the temporary storage of fatalities.

Suggested Actions

- (1) Identifying victims, compiling fatality lists, certifying cause of death for all fatalities;
- (2) mobilizing the designated professional and reserve personnel to carry out mortuary functions;
- (3) contact cold storage facilities and secure supplies;
- (4) releasing bodies for temporary storage or embalming and final disposal as appropriate; and,
- (5) calling upon the services of mutual aid partners.

Suggested Assignments

Coroner's Office (or Chief Medical Examiner): overall responsibility for this function.

Coroner's Reserves: augment the Coroner's staff.

Public Health Department: assist in monitoring this function.

Non-governmental support could come from private physicians in helping to determine cause of death, private hospitals to store corpses, mortuaries to help in disposing of corpses as soon as cause of death and identity are certified, and the **American Red Cross** in compiling, publishing or otherwise providing fatality information to be used in the **American Red Cross** family service casework.

PUBLIC INFORMATION (ERF-10)

This function includes continuous communications with the public through all available media to provide hazard warnings, official instructions and announcements, status of critical lifeline and emergency services, and damage information. This includes the operation of an emergency information center as part of an EOC, as well as provisions for meeting the needs of the press and public inquiries.

Suggested Actions

- (1) Coordinating with the EBS or other official communication systems to issue warnings and advice on the continuing threat of fire, building collapse, aftershocks and other hazards, providing self-help and recovery information, and providing information on the location of medical, mass care and other assistance centers;
- (2) ensuring that existing internal and external emergency communications equipment is functioning and obtaining additional equipment as needed;

- (3) activating and operating emergency information centers in close conjunction with the EOC.
- (4) monitoring radio, television and press bulletins to access outlets that are functioning;
- (5) providing rumor control and assessing accuracy of reports;
- (6) issuing news bulletins;
- (7) accrediting and accommodating out-of-area news reporting teams;
- (8) coordinating with city, state and federal public information officers;
- (9) utilizing information status reports at command outlets;
- (10) maintaining open lines of communications with surrounding outside agencies;
- (11) designating and establishing press time and assigning staff support;
- (12) releasing mass media warnings with instructions on safety, recovery services and evacuation procedures; and
- (13) ensuring emergency information is translated for special populations (non-English speaking, persons with disabilities).

Suggested Assignments

Public Information Office: overall management of public information, and coordination of media.

Emergency Services Office: coordinate with city, state and federal public information officers: give periodic damage assessment update, maintain communications.

Fire Services, Transportation, Building and Safety, Sheriff's Departments, Flood Control District, Public Health Department and water and sanitation districts: advise public of various dangers they may still face, status of the emergency and give instructions to the public.

Support could come from privately owned utility companies that will advise the public on necessary precautions when using electricity, gas and water utilities, and the print and broadcast media in presenting news and public service messages to survivors.

EMERGENCY SHELTER AND MASS CARE (ERF-11)

These actions include the emergency housing, feeding, and non-medical care of earthquake victims and emergency services personnel. It includes registration and inquiry services.

Suggested Actions

- (1) Activating as many shelters as feasible and needed;
- (2) mobilizing and monitoring all professional and volunteer personnel assigned to these facilities;
- (3) establishing emergency shelter and mass care facilities at safe sites, including alternate sites;
- (4) coordinating shelter operations and needs with local EOCs and logistical support function;
- (5) mobilizing professional and volunteer staff to operate shelters;
- (6) establishing staffing needs for mass care and requesting necessary supplies; and
- (7) establishing registration and disaster welfare and inquiry services at shelter sites.

Suggested Assignments

American Red Cross: operate and manage emergency mass care shelters under agreements with the State of California Office of Emergency Services and Department of Social Services.

Personnel Department: provide staff for shelters.

Schools: provide mass care facilities.

Support could come from the American Red Cross and RACES in maintaining communications between shelters and EOC, religious and other volunteer organizations in staffing shelters, and private businesses.

RESOURCES AND LOGISTICAL SUPPORT (ERF-12)

These actions relate to the procurement, allocation and distribution of essential resources and specialized services in support of the county's emergency response operations.

Suggested Actions

- (1) Procuring, allocating and dispatching personnel and resources to staging areas to receive incoming supplies and equipment;
- (2) determining the extent of merchandise damage and listing available supplies needed for emergency response efforts;
- (3) contacting and assigning volunteer groups for transport service;
- (4) making logistical arrangements to utilize other resource groups and resources outside of the heavily damaged areas;
- (5) opening purchase orders for providing emergency response equipment; and
- (6) activating special agreements with non-governmental entities for logistical support.

Resources and Logistical Support consists of, but is not limited to the following:

Consumables Distribution

These actions include collecting and distributing items such as paper products, washing and cleaning supplies, disinfectants, bedding and building materials to mass care centers and other distribution sites.

- (1) Obtaining and providing supplies of consumable commodities to emergency shelters, mass care centers, critical facilities and the public;
- (2) informing suppliers of anticipated needs, based on available supplies and rates of usage; and
- (3) setting up delivery sites for consumables distribution, and mobilizing private suppliers.

Food and Water Distribution

- (1) Procuring and arranging the distribution of food and water for emergency shelters, mass care centers, critical facilities or other distribution points as they are established;
- (2) coordinating with potential food and water suppliers from the private sector and arranging logistical support; and
- (3) coordinating with water utility companies in estimating available supply levels, impact of potential water contamination, and destruction to distribution systems.

Energy

- (1) Procuring and arranging for the distribution of energy/fuel supplies in support of emergency response organizations; and
- (2) coordinating with energy supply sources (public/private utilities and commercial outlets) in setting distribution priorities and providing logistical support.

Suggested Assignments

General Services Department: coordinate resources and logistical support.

Personnel Department: provide volunteer personnel.

Purchasing Department: activate pre-negotiated purchase agreements with vendors and contractors and keep for emergency expenditures accounts.

Transportation Department: distribution of supplies.

Support could come from the American Red Cross and volunteer organizations, in distributing necessary food, water, and consumable goods, public utilities and commercial outlets in the procuring energy resources, and private businesses and vendors in providing consumable goods and food.

LAW ENFORCEMENT (ERF-13)

These actions provide law enforcement, protect lives and property, and establish control procedures as necessary in and around emergency areas.

Suggested Actions

- (1) Enforcing laws, rules and regulations to protect life and property, preserve peace and order and control traffic;
- (2) providing security for facilities and resources;
- (3) enforcing traffic laws and regulations; and
- (4) providing security patrol for evacuated areas.

Suggested Assignment

Sheriff's Department: overall law enforcement, with assistance of the Department Reserves and Auxiliary Groups, and California Law Enforcement Mutual Aid Plan.

INSPECTION, CONDEMNATION AND DEMOLITION (ERF-14)

These actions include the inspection of buildings and other structures to determine whether it is safe to inhabit or use them after a damaging earthquake. Building officials will determine if buildings should be closed or demolished.

Suggested Actions

- (1) Activating mutual aid agreements for resources necessary to meet building inspection needs;
- (2) mobilizing and dispatching inspection teams to buildings and structures which are critical to emergency operations or which threaten public safety;
- (3) inspecting and posting less critically damaged structures for occupancy or condemnation;
- (4) arranging for the demolition of condemned structures, or otherwise abating hazards;
- (5) documenting (by photograph if possible) justification for condemnation or demolition.

Suggested Assignments

Building and Safety Department: coordinate the inspection, condemnation and demolition function.

Flood Control District: assess and manage threats posed by dams and related structures.

Fire Services Department: manage toxic and non-flammable hazards.

Risk Management, Parks and Recreation and Real Property Departments: provide information regarding County-owned and leased structures.

Sheriff's Departments: evacuate unsafe structures and inundation areas.

Support could come from contractors to demolish structures which pose a threat to public safety, **Structural Engineer's Association of California** (coordinated through the **State Office of Emergency Services, OES**) to determine if important buildings are inhabitable, the **American Red Cross** and homeowners to inspect their homes for damage, and the **American Society of Civil Engineers** to assess the threats from damaged structures other than buildings.

EMERGENCY ROUTE REPAIR (ERF-15)

These actions include repairs and temporary shoring of bridges and other road components necessary for emergency response activities and for public safety.

Suggested Actions

- (1) Mobilizing and dispatching repair crews to damaged or collapsed bridges and damaged or obstructed roads;
- (2) repairing or temporarily reinforcing those bridges and patching, clearing and reinforcing those roads which can be repaired;
- (3) advising the transportation, debris removal, search and rescue, and logistical support functions of road and bridge repair capabilities; and
- (4) clearing roadways temporary for emergency vehicle access.

Suggested Assignments

Transportation Department: road and bridge repair.

Sheriff's Department: assist in traffic control.

Support could come from the State Department of Transportation.

Support could also come from construction contractors to make temporary repairs in bridges and roads and the **American Society of Civil Engineers** to inspect and make recommendations concerning bridges and roads.

UTILITIES AND LIFELINE REPAIRS (ERF- 16)

These actions include the temporary repair of electric power, natural gas, water, sewer and telephone systems to minimize the impact on critical services and the public. Examples are closing or isolating damaged areas, and using shunts and bypasses.

Suggested Actions

- (1) Mobilizing public utility and private contract repair crews;

- (2) reporting major utility damage to designated EOCs through utilities coordinators;
- (3) providing information for public information broadcasts on dangers from damage to the natural gas, electrical and water distribution systems and from damage or shutdown of wastewater systems;
- (4) coordinating water system loss or restoration with fire fighting, hazardous materials management and sewage treatment;
- (5) repairing essential utilities and restoring services according to established priorities; and
- (6) rationing gas, water, electrical power, and telephone service as directed.

Suggested Assignments

The respective **public utilities** have the primary responsibility for this function.

Emergency Services Office: coordinate damage information to and from the EOC and the utilities.

Fire Services Department: manage toxic and non-flammable hazards.

Special Districts: help manage and restore water and sewer services.

Support could come from private contractors to supplement utility personnel and equipment.

**EMERGENCY RESPONSE
ELEMENT**

FUNCTION MATRIX

	DISASTER MANAGEMENT	DAMAGE ASSESSMENT	COMMUNICATIONS	TRANSPORTATION	DEBRIS CLEARANCE	SEARCH AND RESCUE	FIREFIGHTING/HAZARDOUS MATERIALS MANAGEMENT	EMERGENCY MEDICAL CARE	PUBLIC INFORMATION	EMERGENCY SHELTER/MASS CARE	RESOURCES/LOGISTICAL SUPPORT	LAW ENFORCEMENT	INSPECTION/CONDEMNATION/DEMOLITION	EMERGENCY ROUTE REPAIR	UTILITIES/LIFELINE REPAIR
BOARD OF SUPERVISORS	●														
COUNTY ADMINISTRATION															
COUNTY COUNSEL															
BUILDING & SAFETY		●				●			●				●		
COMMUNICATIONS			●												
COMMUNITY DEVELOPMENT															
COUNTY ASSESSOR															
DATA PROCESSING															
EMERGENCY SERVICES	●	●	●					●	●	●					●
FINANCE											●				
FIRE	●	●	●			●	●	●	●				●		●
GENERAL SERVICES								●			●				
PARKS & RECREATION													●		
PERSONNEL	●									●	●				
PLANNING		●			●								●		
PUBLIC INFORMATION									●						
PUBLIC WORKS		●	●		●				●				●		●
RISK MANAGEMENT													●		
SHERIFF															
SOCIAL SERVICES										●					
TRANSPORTATION		●		●	●				●		●			●	
AIRPORT/HARBOR															
AMERICAN RED CROSS	●	●						●		●	●		●		
PRIVATE SECTOR		●		●	●	●	●	●		●	●		●	●	●
SCHOOLS										●					
SPECIAL DISTRICTS					●				●				●		●
VOLUNTEER ORGANIZATIONS		●	●		●	●	●			●	●				
UTILITIES	●								●		●				●

RECOVERY

RECOVERY FUNCTIONS

(ACTIONS TO BE TAKEN DURING THE FIRST DAYS THROUGH SEVERAL YEARS AFTER THE EARTHQUAKE OCCURS)

Recovery functions, begun immediately after emergency response operations, will return communities to normal conditions. The emphasis will pass from life-saving to cleaning up the community, returning people to work and school, and planning for recovery and reconstruction. Disrupted telephone service, water rationing and similar factors may hamper recovery functions. Aftershocks may also disrupt recovery for some months. Recovery management is a function that will guide recovery from its early stages through longer-term reconstruction. While most of the functions described below focus on the restoration of services and the return of normal community life recovery management ensures that there will be community guidance and leadership throughout the long rebuilding process.

RECOVERY PLAN IMPLEMENTATION (RF-1)

The actions include identifying and implementing recovery plans for reconstruction, zoning, land-use and building regulations based on post-earthquake conditions. This function provides the opportunity for updating the County's Seismic Safety Plan and upgrading building codes.

Suggested Actions

- (1) Delineating/evaluating hazardous areas (defined as areas that experienced ground rupture, ground failure, inundation, intense ground shaking);
- (2) making recommendations for stabilization or limited use of hazardous areas, to include testing lifeline networks and underground storage tanks;
- (3) reviewing/revising the County's General Plan and Seismic Safety Element as necessary;
- (4) ensuring compliance with state-of-the-art design and construction standards;
- (5) issuing temporary use permits as necessary; and
- (6) reviewing plans and issuing building permits for major repair or new construction.

Suggested Assignments

Planning Department: review and update zoning regulations and the County's Seismic Safety Element, evaluate hazardous areas, review plans and issue permits.

Board of Supervisors: propose and adopt changes to plans, codes or ordinances.

- (6) maintaining internal communications, rumor control, and press hotlines;
- (7) keeping the public informed of transportation routes, closures, lifeline status;
- (8) maintaining an emergency information center and press center until otherwise directed;
- (9) gathering and disseminating instructions, warnings and announcements (i.e., instructions for assessing damage and dealing with unsafe buildings);
- (10) issuing warnings about unsafe areas, structures and facilities;
- (11) publicizing an official list of assistance centers and shelter openings and closings, recovery plans, and other recovery efforts;
- (12) announcing school and work site reopenings;
- (13) maintaining open lines of communication with outside agencies and jurisdictions;
and
- (14) providing the necessary information for mass media announcements concerning recovery efforts and care centers in the County.

Suggested Assignments

Recovery and Reconstruction Authority: provide information on policies and programs.

Chief Administrative Office: direct public information activities.

Public Information Office: disseminate information on the County's recovery activities.

Emergency Response Organizations (Fire and Police Departments): report status of recovery efforts.

Schools, volunteer organizations, the American Red Cross, private business and the media can inform the public of the progress of relevant recovery efforts.

RE-ESTABLISHMENT OF GOVERNMENT SERVICES (RF-5)

This includes reinstating suspended or curtailed government activities such as permits and licenses issuance, resumption of school, court sessions and claims processing. They do not fully operate until personnel have been released from emergency duties, utility services have been restored and structures have been inspected and determined safe.

Suggested Actions

- (1) Evaluating emergency needs and returning public employees to their usual assignments;
- (2) scheduling emergency services personnel back to normal work hours and shifts where possible;
- (3) inventorying repairing and replacing emergency equipment and operational supplies;
- (4) coordinating the priorities for restoring government services with the restoration of necessary utility services;
- (5) calling school back into session, and briefing school staff on psychological problems of students, maintenance, logistics, scheduling classes, and other operational issues;
- (6) coordinating the use of mass care shelters with the reopening of schools;
- (7) deciding whether to relocate or discontinue the Emergency Operations Center; and
- (8) providing a location(s) for state and federal assistance office.

Suggested Assignment

Chief Administrative Office/Board of Supervisors: direct the re-establishment of government services.

School Districts and the Office of the Superintendent of Schools: re-establish schools.

Personnel Department: manage the return to work of County employees.

Building and Safety, Parks and Recreation, Real Property and Risk Management Department: locate temporary facilities from which to operate and replacing supplies necessary to resume service.

General Service Department: replace/replenish materials needed to resume service.

Department of Social Services: resume services to public.

Support could come from the **School Districts** in managing the return of school activities, **public utilities** in providing vital services to government buildings, and private vendors in supplying government agencies with needed supplies.

DISASTER ASSISTANCE (RF-6)

This function includes activities to help victims obtain financial and in-kind assistance. Financial assistance includes both public and private grants, loan payments, and insurance claims.

Suggested Actions

- (1) Initiating Disaster Service Center operations;
- (2) continuing registration and welfare inquiry services, and shelter care for lost, homeless, injured or ill persons in the disaster area;
- (3) helping victims complete government application forms for aid advocacy in insurance settlements, grants and loans; and
- (4) locating and preparing sites for temporary housing.

Suggested Assignments

Chief Administrative Office: coordinate disaster assistance between the City, County, State and Federal activities.

Social Services Department: assist individuals and businesses in completing disaster assistance forms.

Support could come from Registrar of Voters, Public Information Office, and State and Federal agencies.

The American Red Cross, religious and volunteer organizations and the business community could help victims obtain food, water, clothing, counseling, and with minor home repairs and removal of debris.

HAZARD ABATEMENT (RF-7)

This function includes inspecting, posting, closing and demolishing hazards which represent a threat to public safety. These actions are a continuation of the emergency response function of Inspection, Condemnation and Demolition, and may continue over a period of months.

Suggested Actions

- (1) Completing ground survey and mapping of damaged structures;

- (2) inspecting repairs to buildings previously posted for non-occupancy or limited access;
- (3) condemning unsafe structures;
- (4) continuing repairs on damaged infrastructure on a priority basis;
- (5) assessing and controlling the remaining flood, fire and hazardous materials threat;
- (6) inspecting areas where hazardous materials are stored, used and processed before issuing permits to resume activities; and
- (7) documenting (photographically if possible) justification for condemnation and demolition of all structures.

Suggested Assignments

County Counsel: responsible for demolition contracts.

Building and Safety Department: direct building hazard abatement activities; identify and post hazards.

Fire Services Department: reduce fire and hazardous materials and reinstate hazardous materials processes.

Support could come from independent demolition contractors to help abate structural hazards and structural engineering associations to assist in inspecting structures.

TRANSPORTATION RESTORATION (RF-8)

These activities re-establish transportation routes through detours, minor repairs, the permanent removal of debris, and the development of temporary access roads. Intermodal links are also re-established and extraordinary traffic conditions are managed.

Suggested Actions

- (1) Reviewing the priority list for restoring damaged or closed highways, streets, roads, and continuing necessary repairs;
- (2) providing updated information on highway availability and road closures;
- (3) moving debris from roadways, shoulders and other temporary locations to permanent disposal sites;
- (4) re-opening closed highways and streets according to priorities;

- (5) monitoring and assessing the continued use of emergency mass transportation systems and disaster continuing them where possible; and
- (6) re-establishing air and marine transportation facilities.

Suggested Assignments

Transportation Department: direct road repair, coordinate local and regional transit authorities for restoring transportation services.

Airport and Harbor Departments: return their facilities to full operating use.

Flood Control District: help dispose of debris and rebuild bridges.

Sheriff's Department: help with traffic control.

Private construction contractors, engineering consultants and vendors could augment public agency capabilities; railroads should re-establish rail service to the region.

UTILITIES RESTORATION (RF-9)

These actions include returning electric power, natural gas, telephone, water, and sewer utilities and systems to normal operations. Final repair and restoration of utility systems will last several months.

Suggested Actions

- (1) Completing ground survey and mapping of damaged lifeline systems such as water, sewer, electrical, pipeline and communications;
- (2) establishing a priority list for re-establishing utility services, and continuing necessary repairs;
- (3) providing power and fuel to emergency service efforts;
- (4) systematically returning services to the public.

Suggested Assignments

Chief Administrative Office: in conjunction with the Utility Companies: establish priorities for repair of utility services.

Transportation Department: provide assistance to emergency services and communication efforts needed for re-establishing utility services.

DISASTER ACCOUNTING (RF-10)

This function covers ways to document and tally costs arising from an earthquake. This information will document insurance claims, substantiate disaster assistance and speed payment to vendors and mutual aid partners.

Suggested Actions

- (1) Collecting and tallying known or estimated financial losses by type of damage;
- (2) determining approximate cost, basis for estimation, extent of insurance coverage, and location;
- (3) reviewing and expediting invoices, claims and applications for relief from vendors, victims and mutual aid partners;
- (4) setting up a record keeping system to monitor assessed areas and setting up reviews for areas not assessed;
- (5) maintaining records of work and response efforts by county personnel;
- (6) maintaining records of areas covered by search and rescue, medical care, emergency shelter and evacuation; and
- (7) retaining records of volunteer and private groups providing assistance.
- (8) estimating economic costs not covered above for such things as unemployment, lost business opportunities and the effects of the earthquake on employment and business outside the disaster area, if appropriate.

Suggested Assignments

Chief Administrative Office: direct disaster accounting.

General Services Department: implement procedures and mechanisms to monitor costs incurred from earthquakes.

Support could come from Department of Social Services, Tax Assessor Department, Auditor-Controller Department and Personnel Department as well as insurance companies in providing damage estimates.

LONG - TERM RECONSTRUCTION (RF-11)

The actions include designing a long-term recovery strategy, oversight decisions by an elected body, and participation by advisory bodies. This function guides the community through the long rebuilding process.

Suggested Actions

- (1) Having the Recovery and Reconstruction Authority make a preliminary report to the elected body;
- (2) designing a recovery strategy that maximizes new economic growth and development;
- (3) conducting a specific evaluation of need for modification of development in seismically hazardous and damaged areas to reduce the level of future risk;
- (4) adopting changes to pre-event recovery and reconstruction plans based on advisory recommendations;
- (5) authorizing streamlined procedures for prioritized actions;
- (6) reporting progress to the elected body, planning commission and other advisory bodies;
- (7) reviewing the need for special reconstruction procedures and evaluating the effects of streamlined processes;
- (8) periodically adjusting reconstruction procedures, with the objective of restoring the normal process as soon as appropriate;
- (9) restoring the normal development and planning process; and,
- (10) documenting the reconstruction actions and decisions.

Suggested Assignments

Mayor/City Council: guiding and responding to the Recovery and Reconstruction Authority.

Recovery and Reconstruction Authority: direct redevelopment and reconstruction policies

City Administrator's (Manager's) Office: direct reconstruction and monitor county, state and federal activities.

Public Works, Building and Safety, Engineering and Planning Departments: implement policies and programs established by the Recovery and Reconstruction Authority

Support for rebuilding could come from all facets of the private sector, including contractors, engineers, major community employers, financial institutions. Support could also come from regional authorities (transportation commissions, government associations) and public/private advisory bodies.

RECOVERY AND
RECONSTRUCTION
ELEMENT

FUNCTION MATRIX

	RECOVERY PLAN IMPLEMENTATION	RECOVERY MANAGEMENT	RECOVERY FINANCING	PUBLIC INFORMATION	RE-ESTABLISHMENT OF GOVERNMENT SERVICES	DISASTER ASSISTANCE	HAZARD ABATEMENT	TRANSPORTATION RESTORATION	UTILITIES RESTORATION	DISASTER ACCOUNTING	LONG TERM RECONSTRUCTION		
BOARD OF SUPERVISORS	●	●			●						●		
COUNTY ADMINISTRATION		●	●	●	●	●			●	●	●		
COUNTY COUNSEL		●					●						
BUILDING & SAFETY	●	●			●		●				●		
COMMUNICATIONS													
COMMUNITY DEVELOPMENT		●									●		
COUNTY ASSESSOR										●			
DATA PROCESSING													
EMERGENCY SERVICES			●	●									
FINANCE										●	●		
FIRE				●			●						
GENERAL SERVICES					●					●			
PARKS & RECREATION					●								
PERSONNEL					●					●			
PLANNING	●	●									●		
PUBLIC INFORMATION				●									
PUBLIC WORKS		●			●		●				●		
RISK MANAGEMENT					●								
SHERIFF				●				●					
SOCIAL SERVICES						●							
TRANSPORTATION	●							●	●				
AIRPORT/HARBOR								●					
AMERICAN RED CROSS				●		●							
PRIVATE SECTOR		●		●	●	●	●	●		●	●		
SCHOOLS				●	●								
SPECIAL DISTRICTS													
VOLUNTEER ORGANIZATIONS				●		●							
UTILITIES		●			●				●				

PART III

REFERENCES

GENERAL SEISMOLOGY

Bolt, Bruce A. 1978. *Earthquakes, A Primer*. New York, NY. W.H. Freeman and Company.

A very readable book that describes present knowledge of earthquakes for people with little or no background in earth science. Discusses the causes of earthquakes, how they can be measured, historical events, as well as self-protection in an earthquake and improvements in earthquake-resistant design. Several useful appendices and an earthquake quiz.

Source: Publisher

Gere, James M. and Haresh C. Shah. 1984. *Terra Non Firma - Understanding and Preparing for Earthquakes*. Stanford, CA. Stanford Alumni Association.

Written by engineering professors in a readable style for a non-technical audience. Includes a set of chapters on causes and effects of earthquakes and a comprehensive discussion of engineering, community and individual preparedness measures. Preparedness discussion includes good construction practices, building codes, land use planning, insurance, and specific steps that can be taken before, during, and after the next major earthquake.

Source: Publisher

Seismic Safety Commission. 1983. *Seismic Safety in California: Short History and Current Issues*. Publication No. 83-06. Sacramento, CA. SSC.

A Seismic Safety Commission document summarizing the most important seismic safety initiatives in California and current efforts in reducing earthquake risk.

Source: SSC
1900 "K" Street, Suite 100
Sacramento, CA 95814
(916) 322-4917

Yanev, Peter. 1977. *Peace of Mind in Earthquake Country*. San Francisco, CA. Chronicle Books.

A good basic reference for the layperson on earthquake hazards. Describes in straightforward language the geologic, architectural and structural hazards of earthquakes and recommends techniques for avoiding or correcting them.

Source: Publisher

EARTHQUAKE PLANNING AND LOCAL GOVERNMENTS

Association of Bay Area Governments. 1976. *Hazards Evaluation for Disaster Preparedness Planning*. Oakland, CA. ABAG.

A publication introducing officials to a method for identifying hazards, suggesting some relatively simple methods for presenting some possible guidelines for establishing priorities for hazard reduction or elimination.

Source: ABAG
MetroCenter
PO Box 2050
Oakland, CA 94604
(415) 464-7900

Earle, M. Mark, Thomas W. Fletcher, Ernest C. Harvey, and Charles K. Shafer. 1980. *Multijurisdictional Responses to Urban and Regional Disasters*. Prepared for Federal Emergency Management Agency, Washington, D.C. 20472. Menlo Park, CA. SRI International.

Presents the results of an assessment of the multijurisdictional issues needing resolution after the immediate needs of an urban population affected by a major disaster have been met. An 8.3 earthquake affecting San Francisco is used as a scenario.

Source: SRI International
333 Ravenswood Ave.
Menlo Park, CA 94025
(415) 326-6200

Earthquake Preparedness Task Force, Recovery and Reconstruction Advisory Committee. 1984. *Model Recovery Program*. Sacramento, CA. Seismic Safety Commission and Office of Emergency Services.

Guidelines for communities and corporations to use in preparing successfully to recover from a major earthquake. A major theme is that hazard mitigation, emergency response and recovery planning are interrelated parts of earthquake preparedness.

Source: Office of Emergency Services
2800 Meadowview Road
Sacramento, CA 95832
(916) 427-4990

Federal Emergency Management Agency. 1980. *An Assessment of the Consequences and Preparations for a Catastrophic California Earthquake: Findings & Actions Taken*. Washington, D.C. FEMA.

This review provided the overall assessment that the Nation is essentially unprepared for the expected catastrophic earthquake. Because of the large concentration of population and industry, impact of such an earthquake would surpass those of any natural disaster thus far experienced by the Nation. This is a seminal reference document, including scenarios, assessment of losses, assessment of current state of readiness capability and assessment of social impacts.

Source: FEMA
The Presidio, Building 105
San Francisco, CA 94129
(415) 556-9881

Gori, Paula L. (Ed.) 1984. *Primer on Improving the State of Earthquake Hazards Mitigation and Preparedness*. Open File Report 84-772. Reston, VA. U.S. Geological Survey.

A set of papers selected from 12 USGS workshops held over the past several years to improve the state of earthquake preparedness. Topics include earthquake hazard preparedness (gaining attention and commitment); land use planning and relation; earthquake-resistant design; transfer of scientific and technical information; and seismic safety organizations.

Source: USGS
905 National Center
Reston, VA 22092

Jaffe, Martin, JoAnn Butler, and Charles Thurow. 1981. *Reducing the Earthquake Risks: A Planners Guide*. Chicago, IL. American Planning Association.

This report examines seismic safety programs that can be considered by local planners. Assessment of seismic hazards, starting a plan, mapping hazards, seismic safety programs and recovery planning are explained. Earthquakes and their effects on buildings are discussed in the appendix.

Source: American Planning Association
1313 E. 60th Street
Chicago, IL 60637

Margerum, Terry. March 1980. *We're Not Ready for the Big Quake, What Local Governments Can Do*. Oakland, CA. ABAG.

A good introduction to the importance of planning for a major earthquake. Discusses what to expect after a major event, what's being done at the state and local level, why more isn't being done and specific actions that local governments can undertake.

Source: ABAG
MetroCenter
PO Box 2050
Oakland, CA 94604
(415) 464-7900

Morentz, James W., Hugh C. Russell and Judith A. Kelly. 1984. *Exercise Sourcebook-Orientation and Tabletop Exercises*. Rockville, MD. Research Alternatives.

Three types of exercises (orientation, discussion, and tabletop) discussed in this manual. Presents information on preparing for an exercise (including writing scenarios or problems), facilities and staff required, conducting the exercise and doing a critique of it.

Source: Research Alternatives
966 Hungerford Dr., Suite 31-B
Rockville, MD 20850
(301) 424-2803

Petak, William J. (Ed.). "Emergency Management: A Challenge for Public Administration" *Public Administration Review*. January 1985. Vol. 45, Special Issue.

The entire volume of this PAR is devoted to articles on emergency management, written by a number of different scholars in the field. Several topics are covered, including recovery, emergency medicine, liability, financing emergency management, and intergovernmental issues.

Source: American Society for Public Administration
1120 "G" Street, N.W.
Washington, D.C. 20005

Public Technology, Inc. n.d. *Seismic Design for Police & Fire Stations*. Washington, D.C. & Pasadena, CA. Public Technology, Inc.

A report that reviews problem of seismic safety for public safety departments, critical functional areas and their vulnerability, design guidelines and facility cost impacts.

Source: Public Technology Inc.
1140 Connecticut Ave., N.W.
Washington, D.C. 20036

Scott, Stanley. 1979. *Policies for Seismic Safety: Elements of a State Governmental Program*. Berkeley, CA. Institute of Governmental Studies, University of California.

A report distilling the principal results of California's experience in seismic safety, through 1978. Discusses governmental responsibilities, the critical facilities, planning, development and land-use control, and emergency preparedness and recovery. Discusses important California law (for schools, hospitals, structures in hazardous faults zones) and other programs such as seismic safety elements, dam safety program, inundation mapping, evacuation planning, and freeway retrofitting.

Source: Institute of Governmental Studies
University of California
Berkeley, CA 94705
(415) 642-1428

Scott, Stanley. 1979. *What Decisionmakers Need to Know: Policy and Social Science Research on Seismic Safety*. Berkeley, CA. Institute of Governmental Studies, University of California.

A report based on a meeting of the EERI Committee on Social Science and Public Policy Research. Nine speakers' papers are included, representing a range of backgrounds - geology, engineering, architectural, urban planning, public policy and the Social Sciences. Each speaker gave his view regarding priority topic areas for further public policy research.

Source: Institute of Governmental Studies
University of California
Berkeley, CA 94705
(415) 642-1428

Seismic Safety Commission. 1982. *Earthquake Hazards Management - An Action Plan for California*. Sacramento, CA. SSC.

A report that outlines measures designed to deal with earthquake hazards in a more comprehensive way. These proposals emphasize the critical role of State government in earthquake safety and include new initiatives, refinements for existing programs and topics that need further study to guide the formulation of appropriate policies.

Source: SSC
1900 "K" Street, Suite 100
Sacramento, CA 95814
(916) 322-4917

Wyner, Alan J. and Dean E. Mann. 1983. *Seismic Safety Policy in California: Local Governments and Earthquakes*. Santa Barbara, CA. Department of Political Science, University of California, Santa Barbara.

A report summarizing how thirteen California jurisdictions plan and implement seismic safety policies. The data was collected from 1977 to 1980. Seismic safety elements, insurance, land use planning and building codes were all examined. A variation was found in community response, although generally seismic safety did not receive a high priority.

Source: Department of Political Science
University of California
Santa Barbara, CA

STRUCTURAL HAZARD MITIGATION

Arnold, Christopher and Robert Reitherman. 1982. *Building Configuration and Seismic Design*. New York, NY. John Wiley & Sons.

A well-documented and extensive study of the principles of earthquake resistant architectural design. A straightforward and clear non-mathematical state of the art document. Case studies, photographs and illustrations, annotated bibliography.

Source: Publisher

Berg, Glen V. 1983. *Seismic Design Codes and Procedures*. Berkeley, CA. Earthquake Engineering Research Institute.

A volume in an EERI Monograph series, introducing the reader to the design of earthquake-resistant structures. Discusses various building codes and makes comparisons.

Source: EERI
2620 Telegraph
Berkeley, CA 94704
(415) 848-0972

Botsai, Elmer E., Alfred Goldberg, John L. Fisher, Henry J. Lagorio and Thomas D. Wosser. n.d. *Architects and Earthquakes*. Washington, DC. AIA Research Corporation, American Institute of Architects.

A concise but comprehensive architect's guide to earthquake relevant consideration in building design. Explanation of current theory of earth movement, courses of earthquakes and their effects on structures. Well chosen descriptive photographs of building damage. Glossary especially helpful.

Source: AIA Research Corporation
1735 New York Ave.
N.W., Washington, DC 20006

Eagling, Donald G. (Ed.). 1983. *Seismic Safety Guide*. LBL-9143, UC-11. Berkeley, CA. University of California, Lawrence Berkeley Laboratory.

A collection of papers on principal topics of earthquake safety: design principles for new buildings, evaluation and rehabilitation of existing structures, earthquake preparedness planning, risk management. Photographs, illustrations, appendices.

Source: Lawrence Berkeley Laboratory
University of California
Berkeley, CA 94720

Seismic Safety Commission. 1983. *The Construction Process: Quality Control, Inspection and Performance*. Publication No. 83-05. Sacramento, CA. State of California SSC.

A report of the SSC's Committee on Hazardous Buildings, directed to building owners, designers, code writers, contractors, construction personnel. Identification of the problem, participants in, and the principal needs of the construction process.

Source: SSC
1900 "K" Street, Suite 100
Sacramento, CA 95814
(916) 322-4917

Hazardous Buildings Committee, Seismic Safety Commission. 1980. *Hazardous Buildings: Local Programs to Improve Life Safety*. Publication No. 79-03. Sacramento, CA: State of California Seismic Safety Commission.

A guide for local governments to organize local programs to lessen the hazard of hazardous buildings (unreinforced masonry). Includes a set of recommendations, example hazardous building abatement ordinances, and research papers on legal issues.

Source: Seismic Safety Commission
1900 K Street, Suite 152
Sacramento, CA 95814-4186
(916) 322-4917

NONSTRUCTURAL HAZARD MITIGATION

California Earthquake Education Project. 1983. *What Happened in Coalinga?* Lawrence Hall of Science, University of California at Berkeley, Berkeley, CA. CALEEP.

Viewers use a set of slides of the 1983 Coalinga earthquake to draw conclusions about structural and nonstructural hazards. Viewers are taught how to respond to a number of earthquake situations.

Source: California Earthquake Education Project
Lawrence Hall of Science
University of California, Berkeley
Berkeley, CA 94720
(415) 642-8718

Earthquake Engineering Research Institute. 1984. *Nonstructural Issues of Seismic Design and Construction*. Publication No. 84-04. Berkeley, CA. EERI.

A technical evaluation of the nonstructural earthquake damage issue, based on an NSF sponsored workshop. Four technical papers and a summary of committee discussions grouped in four topical areas. General bibliography of non-structural issues, illustrations included.

Source: EERI
2620 Telegraph Ave.
Berkeley, CA 94704
(415) 848-0972

Reitherman, Robert. 1983. *Reducing the Risks of Nonstructural Earthquake Damage: A Practical Guide*. Van Nuys, CA. Southern California Earthquake Preparedness Project.

Clear guide of before-the-earthquake self-help activities aimed at reducing life loss and injuries from non-structural hazards. Also includes dollar figure of non-structural earthquake damage. Targeted to non-engineering business sector audience. Emergency planning information, structural damage appendix, illustrations, annotated bibliography.

Source: SCEPP
600 S. Commonwealth
Los Angeles, CA 90005
(213) 739-6695

Simonson, Thomas R. 1976. *Basis for Seismic Resistant Design of Mechanical and Electrical Service Systems.*

This report presents the results of a study of various conceptual aspects of the dynamic interaction of building components during earthquakes, with emphasis on mechanical and electrical service systems. Current codes and practices are examined, and the nature of earthquake motions within buildings--from both historical and analytical viewpoints--are investigated. Principal analysis and design approaches which allow for either the prediction of these motions or direct specification of design forces are examined and compared. In light of these studies, the various possible strategies to mitigate earthquake damage of service systems are studied and the most promising alternatives indicated.

Source: G.M. & T.R. Simonson
Consulting Engineers
612 Howard Street
San Francisco, CA 94105
and
Engineering Decision Analysis Company, Inc.
480 California Ave.
Palo Alto, CA 94306

EMPLOYEE AWARENESS

American Red Cross. 1984. *Employee Earthquake Preparedness For The Workplace And Home*. San Francisco, CA. American Red Cross, Golden Gate Chapter.

Before, during and after the earthquake actions and behavior for workplace and home. Tips for storing food and water; supply lists for home emergency needs and basic first aid. Checklists included. Concise descriptions.

Source: American Red Cross
1550 Sutter Street
San Francisco, CA 94109
(415) 776-1550

American Red Cross. 1984. *Safety and Survival in an Earthquake*. Los Angeles, CA. Los Angeles Chapter, American Red Cross.

Information on how to prepare for an earthquake: develop family disaster plans, stockpile. Includes storage tips, sample menus, and first aid. After earthquake checklists, and home preparedness information. Very readable, easy to use.

Source: American Red Cross
1550 Sutter Street
San Francisco, CA 94109
(415) 776-1500

American Red Cross. 1985. *Disaster Preparedness for Disabled and Elderly People*. Los Angeles. American Red Cross, Los Angeles Chapter.

A booklet addressing disabled people in various disaster situations, including earthquakes. General recommendations for preparedness measures to undertake. Individual sections devoted to special problems that people with impaired mobility, hearing, or vision, or the elderly might encounter before, during and after an disaster.

Source: American Red Cross
Golden Gate Chapter
1550 Sutter Street
San Francisco, CA 94109
(415) 776-1500

EQE, Inc. 1985. *The EQE Earthquake Home Preparedness Guide*. San Francisco, CA. EQE, Incorporated.

A booklet on the earthquake threat in California, home safety and preparedness planning. Valuable for its six "projects everyone should do" giving step-by-step procedures to strengthen one's house.

Source: EQE, Inc.
121 Second Street
San Francisco, CA 94105
(415) 495-5500

Kockelman, William J. 1984. *Reducing Losses From Earthquakes Through Personal Preparedness*. Open-File Report 84-765. Menlo Park, CA. United States Dept. of the Interior, Geological Survey.

Discusses actions that can be taken in each of the following phases: pre-event mitigation, preparedness; response; recovery and reconstruction. Personal preparedness includes inspecting and strengthening the home; organizing the neighborhood and securing nonstructural objects. A useful reference document.

Source: USGS
345 Middlefield Road
Menlo Park, CA
(415) 323-8111

Office of Emergency Services. n.d. *Earthquakes California Style*. Sacramento, CA. State of California OES.

A concise fold-out discussing how to prepare for an earthquake, what to do during the shaking and the most appropriate actions to take after the earthquake.

Source: Office of Emergency Services
PO Box 9577
Sacramento, CA 95823

Pacific Telephone. 1983. *Survival - Earthquake Preparedness*. San Francisco Pacific Telephone

An earthquake preparedness booklet for Pacific Telephone employees. Home and office preparedness planning. Stockpile lists.

Source: Pacific Telesis
Room 710, 1 Montgomery Street
West Tower
San Francisco, CA 94104
(415) 774-8427

EQE, Inc. 1985. *The EQE Earthquake Home Preparedness Guide*. San Francisco, CA. EQE, Incorporated.

A booklet on the earthquake threat in California, home safety and preparedness planning. Valuable for its six "projects everyone should do" giving step-by-step procedures to strengthen one's house.

Source: EQE, Inc.
121 Second Street
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Kockelman, William J. 1984. *Reducing Losses From Earthquakes Through Personal Preparedness*. Open-File Report 84-765. Menlo Park, CA. United States Dept. of the Interior, Geological Survey.

Discusses actions that can be taken in each of the following phases: pre-event mitigation, preparedness; response; recovery and reconstruction. Personal preparedness includes inspecting and strengthening the home; organizing the neighborhood and securing nonstructural objects. A useful reference document.

Source: USGS
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Office of Emergency Services. n.d. *Earthquakes California Style*. Sacramento, CA. State of California OES.

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Source: Office of Emergency Services
PO Box 9577
Sacramento, CA 95823

Pacific Telephone. 1983. *Survival - Earthquake Preparedness*. San Francisco Pacific Telephone

An earthquake preparedness booklet for Pacific Telephone employees. Home and office preparedness planning. Stockpile lists.

Source: Pacific Telesis
Room 710, 1 Montgomery Street
West Tower
San Francisco, CA 94104
(415) 774-8427

Southern California Earthquake Preparedness Project. 1984. *Learning to Live in Earthquake Country - Preparedness in Apartments and Mobile Homes*. Washington, DC. SCEPP.

A SCEPP brochure on earthquake preparedness issues posed by apartment and mobile home environments. Explanation of how to fix supports for a mobile home to resist earthquakes.

Source: BAREPP
MetroCenter, 101 Eighth Street, Suite 152
Oakland, CA 94607
(415) 540-2713

Southern California Earthquake Preparedness Project. 1984. *Learning to Live in Earthquake Country - Preparedness for People With Disabilities*. Van Nuys, CA. SCEPP.

A brochure dealing with earthquake preparedness measures, and appropriate behavior during and after an earthquake event. General information, with special emphasis on people with impaired mobility and vision. Tips on securing heavy furniture and water heater.

Source: BAREPP
MetroCenter, 101 Eighth Street, Suite 152
Oakland, CA 94607
(415) 540-2713

Southern California Earthquake Preparedness Project. 1984. *Preparedness in High-Rise Buildings*. Van Nuys, CA. SCEPP.

General activities for before, during and after an earthquake. Special problems posed by tall buildings.

Source: BAREPP
MetroCenter, 101 Eighth Street, Suite 152
Oakland, CA 94607
(415) 540-2713

Sunset Special Report. "Getting Ready For a Big Quake." *Sunset* March 1982, pp. 104-111.

An important article, first printed in 1982 and now available as a special report, that documents what homeowners can do to prepare their homes for a major earthquake. Written clearly with photographs and illustrations, it has twenty suggestions for household safety as well as ideas for more ambitious safeguards such as bracing cripple walls and bolting the foundation.

Source: Sunset Books
 Lane Publishing Co.
 Menlo Park, CA 94025

EMERGENCY SHELTER

American Red Cross. Los Angeles Chapter. *Shelter Management*. Los Angeles, CA. American Red Cross.

This resource material has been compiled to assist those who will be in a position of responsibility to fulfill disaster caused needs, i.e., providing shelter and food for disaster victims in the community. The material will assist personnel of public and private schools, parks and recreation departments, churches and any other organization which might be involved in setting-up and managing a shelter.

Source: American Red Cross
2700 Wilshire Boulevard
Los Angeles, CA 90057
(213) 384-5261

Lightsey, James B. 1983. *Emergency Feeding: An Examination of the Problem*. Menlo Park, CA. Saga Corporation.

This 14-page report discusses the problems and considerations in emergency feeding. It includes recommendations for large, medium, and small facilities. It tells you what to store, how to store it, and how much it might cost. Several optional menus and plans are included. Information on water storage, radios, lanterns, stoves, paper goods, and fuel are included.

Source: Saga Corporation
1 Saga Lane
Menlo Park, CA 94025
(415) 854-5150

EARTHQUAKE INSURANCE

Insurance Information Institute. 1985. *Earthquake Insurance in California*. San Francisco, CA. Insurance Information Institute.

This is a folder of materials prepared by the Insurance Information Institute explaining the current laws concerning earthquake insurance and basic preparedness measures to undertake. Folder also contains several general background articles on earthquake.

Source: Insurance Information Institute
400 Montgomery Street
San Francisco, CA 94104

UNDRO. 1984. *The Geneva Papers on Risk and Insurance, II, III, & IV*. Vol 9, #30 - 33 Geneva. Assoc. Inter. pour L'Etude de L'Economie de L'Ass.

Four issues of the quarterly *The Geneva Papers on Risk and Insurance Economics* (Vol. 9, Nos. 30 - 33) are devoted to the issue of natural disasters and insurance. Articles by leading experts in this field address such topics as definitions of disaster insurance, case studies in seismic hazard and risk assessment, risk assessment for insurance programs, and so forth. Contributors include V. Karnick, S.T. Algermissen, F.V. Steinbrugge, and others.

J.H. Wiggins Company. n.d. *Building Losses From Natural Hazards: Yesterday, Today & Tomorrow*. Redondo Beach, CA. J.H. Wiggins Company.

A summary of a major research effort that examined building damage and related losses that could be expected from nine natural hazards, including earthquakes. Each hazard was modeled to provide estimates of annual, and in some cases, catastrophic losses.

Source: J.H. Wiggins Company
1650 South Pacific Coast Hwy.
Redondo Beach, CA 90277
(213) 378-0257

LEGAL LIABILITY

Association of Bay Area Governments. 1984. *Liability of Private Businesses for Earthquake Hazards and Losses - A Guide to the Law, Its Impacts and Safety Implications*. Oakland, CA. ABAG.

An overall guide to a study performed by ABAG on private tort liability which had four major areas of analysis: legal theories of liability; private business and industry's perception of liability and its impact on private sector actions; the value of tort liability in promoting earthquake hazard mitigation, and recommendations based on the findings of the research.

Source: ABAG
MetroCenter, 101 Eighth Street,
Oakland, CA 94604
(415) 464-7900

Association of Bay Area Governments. 1984. *Liability of Private Businesses and Industries for Earthquake Hazards and Losses - Background Research Reports*. Oakland, CA. ABAG.

A guide that summarizes and integrates five background research reports prepared as part of the ABAG project on liability and private businesses. A companion document to the previous entry.

Source: ABAG
MetroCenter, 101 Eighth Street
Oakland, CA 94604
(415) 464-7900

Evans, John G. 1979. *Attorney's Guide to Earthquake Liability*. Oakland, CA. ABAG.

Describes the findings and recommendations of a study of local governments' potential liability for injuries from earthquake-related hazards. Contains a set of recommendations.

Source: ABAG
MetroCenter, 101 Eighth Street
Oakland, CA 94604
(415) 464-7900

Huffman, James. 1985. *Government Liability and Disaster Mitigation: A Comparative Study*.

This study compares the relationship between government liability law and disaster mitigation policy for six countries. These countries were selected on the basis of their exposure to disaster risks, their involvement in disaster mitigation, and the nature of their legal system. The countries represent common law (New Zealand and the United States), civil law (Peru, Japan, and Soviet Union), eastern law (China and Japan), socialist law (China and the Soviet Union), and mixed law systems (China, Japan, and the Soviet Union).

Source: Project on Government Liability
Lewis and Clark Law School
10015 S.W. Terwilliger Blvd.
Portland, OR 97219

Southern California Earthquake Preparedness Project. 1983. *Earthquake Prediction Response: Legal Authorities and Liabilities*. Van Nuys, CA. SCEPP

A review of California law to 1983 to examine and determine authorities and potential liabilities for actions taken or not taken by local governments in response to an earthquake prediction.

Source: SCEPP
600 S. Commonwealth
Los Angeles, CA 90005
(213) 739-6695

COMPUTER SYSTEMS AND EARTHQUAKE HAZARDS

Earthquake Engineering Research Institute. 1983. *Earthquake Damage Mitigation for Computer Systems*. Berkeley, CA. EERI.

One-volume proceedings of a workshop held in July, 1983. It contains a number of contributions relevant to the mitigation of earthquake damage to computer facilities, including structural engineering considerations and isolation systems for computer floors.

Source: Earthquake Engineering Research Institute
2620 Telegraph Ave.
Berkeley, CA 94704
(415) 848-0972

Reitherman, Robert. 1982. *Computer-Aided Earthquake Analysis and Planning for Businesses and Organization*. Redwood City, CA. Scientific Services, Inc.

This extensive research report addresses a computer program, COUNTERQUAKE, which estimates life safety, property loss and disruption effects of earthquakes. From these vulnerability estimates, countermeasures are recommended. The report also reviews literature on earthquake effects prediction and evaluates governmental and private earthquake plans.

Source: Scientific Service, Inc.
527 E. Bayshore
Redwood City, CA 94063
(415) 368-2931

Steinbrugge, Karl V. 1982. *Scenarios for Earthquake Related Problems at Computer Installations Used by Financial Institutions*. Sacramento, CA. SSC.

A report presenting scenarios for earthquake response planning which are intended to mitigate adverse seismic effects to computer installations used by banking, savings and loan, insurance, and other financial institutions in California. It recommends that financial institutions review their exposure to earthquake risk with respect to overall vulnerability of their computer facilities.

Source: Seismic Safety Commission
1900 "K" Street, Suite 100
Sacramento, CA 95814
(916) 323-7949

OCCUPANT BEHAVIOR

Archea, John. 1985. *Human Behavior in Earthquakes*. In *Preparing for Disaster: A Conference in Emergency Planning for Disabled and Elderly Persons*. Washington, D.C. Federal Emergency Management Agency.

Analysis of a Japanese study on human behavior during an earthquake. The study was done in the summer of 1982 in Urukawa, a small fishing village in Japan, that was struck by a major earthquake on March 22, 1982.

Source: FEMA
The Presidio, Building 105
San Francisco, CA 94129
(415) 556-9881

Arnold, Christopher, Michael Durkin, Richard Eisner, and Dianne Whitaker. 1982. *Imperial County Services Building: Occupant Behavior and Operational Consequences as a Result of the 1979 Imperial Valley Earthquake*. San Mateo, CA. Building Systems Development, Inc.

A study examining occupant behavior during the 1979 earthquake, as well as the relocation process for the county agencies that were forced to move, through the closure and eventual demolition of the building.

Source: Building Systems Development, Inc.
3130 La Selva, Suite 308
San Mateo, CA 94403

Durkin, Michael E. 1985. *Behavior of Building Occupants in Earthquakes*. In *Earthquake Spectra*, Vol. 1, No. 2. Berkeley, CA. EERI.

To be truly effective, earthquake hazard reduction measures must be based on a realistic appraisal of occupants' capabilities and actions during earthquakes. Studies suggest that many overly general beliefs about appropriate response can endanger rather than protect building occupants. We need to analyze occupant actions with respect to hazards posed by the seismic performance of specific building types. This paper will review the findings of recent U.S. studies, discuss the applicability of research from abroad, and summarize requirements for continued progress in this vital research area.

Source: Earthquake Engineering Research Institute
2620 Telegraph Ave.
Berkeley, CA 94704

ORGANIZATIONAL SOURCES FOR EARTHQUAKE INFORMATION

American Institute of Architects Foundation
1735 New York Ave., N. W.
Washington, D.C. 20006

American Planning Association
1313 East 60th Street
Chicago, IL 60637
(312) 947-2082

American Society of Civil Engineers
345 East 47th Street
New York, NY 10017
(212) 705-7496

American Red Cross
National Office of Disaster Service
18th and "E" Streets, N.W.
Washington, D.C.
(202) 857-3718

Applied Technology Council
2471 E. Bayshore Rd. (#517)
Palo Alto, CA 94303
(415) 857-3718

Associated General Contractors of America
197 "E" Street, N.W.
Washington, D.C. 20006
(202) 393-2040

Association of Bay Area Governments
MetroCenter
P.O. Box 2050
Oakland, CA 94606
(415) 464-7900

Association of Engineering Geologists
Box 506
Short Hills, NJ 07078
(201) 379-7470

Association of Major City Building Officials
200 North Spring Street
Los Angeles, CA 90012
(213) 485-2021

Bay Area Regional Earthquake Preparedness Project
MetroCenter
101 Eighth Street
Oakland, CA 94607
(415) 540-2713

Business and Industry Council for Earthquake Preparedness
c/o Director for Emergency Planning
Atlantic Richfield Company
515 S. Flower Street
Los Angeles, CA 90071
(213) 486-2535

Building Seismic Safety Council
1015 - 15th Street, N.W.
Washington, D.C. 20005
(202) 322-4917

California Division of Mines and Geology
380 Civic Drive
Pleasant Hill, CA 94523
(415) 671-4920

California Earthquake Education Project
Lawrence Hall of Science
University of California
Berkeley, CA 94720
(415) 327-6017

California Seismic Safety Commission
1900 "K" Street
Sacramento, CA 95814
(916) 322-4917

Earthquake Engineering Research Institute
2620 Telegraph Ave.
Berkeley, CA 94704
(415) 848-0972

Governor's Earthquake Emergency Task Force
California Office of Emergency Services
2800 Meadowview Rd.
Sacramento, CA 95832
(916) 427-4285

International Conference of Building Officials
5360 S. Workman Mill Rd.
Whittier, CA 90601
(213) 699-0541

National Academy of Sciences
Committee on Natural Disasters
2102 Constitution Ave. N.W.
Washington, D.C. 20418
(202) 334-3312

National Bureau of Standards
Center for Building Technology
Room B168, Building 226
Gaithersburg, MD 20899
(301) 921-3471

National Science Foundation
Directorate for Emerging and Critical Engineering Systems
1800 "G" Street, N.W.
Washington, D.C. 20550
(202) 347-5710

Natural Hazards Research and Applications Information Center
University of Colorado
IBS Building #6
Campus Box 482
Boulder, CO 80309
(303) 492-6818

Natural Disaster Resource Referral Service
PO Box 2208
Arlington, VA 22202
(703) 920-7176

Southern California Earthquake Preparedness Project
600 S. Commonwealth
Los Angeles, CA 90005
(213) 739-6695

Structural Engineers Association of California
217 Second Street
San Francisco, CA 94105
(415) 974-5147

U.S. Geological Survey
Office of Earthquakes, Volcanoes, and Engineering
905 National Center
Reston, VA 22092
(703) 860-6471
or
345 Middlefield Rd.
Menlo Park, CA
(415) 323-8111

U.S. Public Health Service
National Institute of Mental Health
Center for Mental Health, Studies of Emergencies
5600 Fishers Lane
Rockville, MD 20857
(301) 443-1910

PART IV

GLOSSARY

PART IV - GLOSSARY OF TERMS

AERIAL RECONNAISSANCE: Conducting an aerial assessment of the damaged area, gathering information on the level and extent of damage and identifying potential hazardous areas for on-site inspections.

CASUALTY COLLECTION POINT: A location within the geographic area used for the assembly, triage (sorting) medical stabilization and subsequent evacuation of casualties. It may also be used for the receipt of incoming medical resources (doctors, nurses, supplies, etc.).

CRITICAL FACILITIES: Includes facilities critical for maintaining health and safety following a disaster. Critical facilities include police and fire department buildings, hospitals, nuclear power plants, chemical processing plants, waste storage and isolation sites.

DISASTER ASSISTANCE CENTER (DAC): A facility established within or adjacent to an impacted area for the purpose of providing disaster victims a "one-stop" service in meeting their emergency and/or rehabilitation. It is usually staffed by appropriate representatives of federal, state, and local governmental agencies, private service organizations and certain representatives of the private sector.

DISASTER WELFARE INQUIRY (DWI): This service provides health and welfare reports about relatives and other individuals believed to be in a disaster area when normal communications are disrupted.

EARTHQUAKE INTENSITY: A measure of the ground shaking obtained from the damage done to structures. Intensity depends upon the earthquake magnitude, distance from epicenter, and local geology.

EARTHQUAKE MAGNITUDE: A measure of the size of an earthquake, determined by measurements from seismographic records.

EARTHQUAKE PREDICTION: Specifies the expected magnitude range, time interval and geographical area of an anticipated future earthquake.

EARTHQUAKE RISK ANALYSIS AND MAPPING: Includes identifying and plotting the expected consequences of future seismic events within a geographic area. Examples of consequences may be life, economic or structural losses.

EMERGENCY: (federal definition) Any hurricane, tornado, storm, flood, high water, wind-driven water, tidal wave, tsunami, earthquake, volcanic eruption, landslide, mudslide, snowstorm, drought, fire, explosions, or other catastrophe in any part of the United States which requires Federal emergency assistance to supplement State and local efforts to save lives and protect public health and safety or to avert or lessen the threat of a major disaster.

EMERGENCY BROADCAST SYSTEM (EBS): Enables the president and Federal, State and local governments to communicate with the public through commercial broadcast stations in the event of a war-caused emergency or, in some cases, large natural disaster. EBS uses the facilities and personnel of the broadcast industry on a voluntary organized basis. It is operated by the industry under rules and regulations of the Federal Communications Commission.

EMERGENCY OPERATIONS: Actions taken during the emergency period to protect life and property, to care for affected people, and to temporarily restore essential community services.

EMERGENCY OPERATING CENTER (EOC): A centralized facility from which emergency operations can be directed and/or coordinated. To be effective, an EOC must provide adequate working space, be properly equipped and most importantly, afford a capability to communicate with field units.

EMERGENCY PUBLIC INFORMATION CENTER (EPIC): A facility established as a central place to prepare and release coordinated emergency public information. It is generally located within, or immediately next to an Emergency Operations Center or Disaster Field Office.

FEDERAL DISASTER ASSISTANCE: This provides in-kind and monetary assistance to disaster victims, state, or local government by Federal agencies under the provision of the Federal Disaster Relief Act and other statutory authorities of Federal agencies.

FIRST AID STATIONS: A location within a mass care center or casualty collection point where first aid may be administered to disaster victims.

FUNCTION: A set of actions which an individual(s), office(s), or organization(s) is assigned to carry out.

JOINT POWERS AGREEMENT: Any local agency can form an agreement with any other agency to exercise any power that is common to all parties to the agreement provided that the limitation of the exercise of the power must be the same as one of the parties which has to be named in the agreement (see State Government Code, Section 6500).

LIFELINES: Includes the infrastructure for (storage, treatment, and distribution) fuel, communication, and water and sewage systems.

LOCAL EMERGENCY: (state definition) A duly proclaimed existence of conditions of disaster or of extreme peril to the safety of persons and property as air pollution, fire, flood, storm, epidemic, riot, or earthquake, or other conditions, other than conditions resulting from a labor controversy, which conditions are or are likely to be beyond the control of the services, personnel, equipment, and facilities of that political subdivision and require the combined forces of political subdivisions to combat.

MASS CARE FACILITY: A location such as a school at which temporary lodging, feeding, clothing, registration welfare inquiry, first aid, and essential social services can be provided to disaster victims during the immediate/sustained emergency period.

MASTER MUTUAL AID AGREEMENT: (state definition) The California Disaster and Civil Defense Master Mutual Aid Agree reimbursement made, and entered into by and between the State of California, its various departments and agencies, and the various political subdivisions of the state.

MUTUAL AID: An agreement in which two or more parties agree to furnish resources and facilities and to render services to each and every other party of the agreement to prevent and respond to any type of disaster or emergency.

RICHTER MAGNITUDE SCALE: The Richter Magnitude scale (named after Dr. Charles Richter) is the scale most commonly used to measure the amount of energy released during the earthquake.

SCENARIO: A planning tool which projects and quantifies the effects of a hypothetical seismic event or the prediction of an event. This information is used to assist preparedness, response, and recovery planning.

SEISMIC HAZARD: The expected occurrence of a future seismic event that will adversely affect human activity.

SELF-HELP: A concept describing self-reliance and sufficiency within an adverse environment with limited or no external assistance.

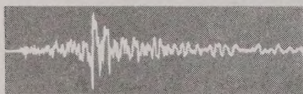
TASK/MISSION ASSIGNMENT: Specific designation of a set of actions to be carried out by an individual(s), office(s), and/or organization(s).

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BAREPP



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EARTHQUAKE PREPAREDNESS
PROJECT**

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